KING EDWARD VI
HANDSWORTH GRAMMAR
SCHOOL FOR BOYS

KING EDWARD VI
ACADEMY TRUST
BIRMINGHAM

Year 8

2025 Mathematics 2026

Unit 10 Booklet

HGS Maths

Tasks

Dr Frost Course

Name: _____

Class: _____

Contents

1 Estimation

1.1 Estimations

Worked Example	Your Turn
Estimate: a) $409 + 571$ b) $\frac{409+571}{0.53}$ c) $\frac{409+571}{0.53-0.11}$	Estimate: a) $593 + 401$ b) $\frac{593+401}{0.47}$ c) $\frac{593+401}{0.47-0.43}$

Dr Frost 188a and 188b

Fill in the Gaps

Question	Values Rounded to 1 sf			Calculation	Estimated Answer	Overestimate or Underestimate?	Actual Answer
$3.3 \times 2194 \times 1.2$	3.3	2194	1.2			*Underestimate*	8688.24
	3	2000	1				
$\frac{17.8 + 67.3}{12.29}$	17.8	67.3	12.29	$\frac{20 + 70}{10}$		*Overestimate*	6.92
	20	70	10				
$\frac{47 \times 78.6}{0.53}$	47	78.6	0.53	$\frac{50 \times 80}{0.5}$			
$\frac{1.78^3}{62.1 + 43.3}$	1.78	62.1	43.3				
$\frac{\sqrt{103}}{0.98 \times 19}$	103	0.98	19				
$\frac{5.34 + 3.296}{0.195}$	5.34	3.296	0.195				
$\frac{(4.12 \times 0.53)^2}{\sqrt[3]{7.97}}$	4.12	0.53	7.97				

Worked Example	Your Turn
An aerospace engineering company produces 4 aircraft wings every day. The factory is open 305 days of the year. By rounding the number of days to one significant figure, estimate the total production over the course of a year.	Bautista has an oil tank and uses 22.7 litres of oil each day. There are 596 litres of oil in Bautista's oil tank. By rounding each number to one significant figure, estimate the number of days it will be until his tank is empty.

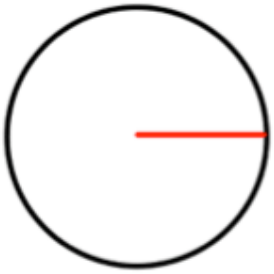
Worked Example	Your Turn
A printing press produces 1919 newspapers per hour for 18 hours each day. Each delivery van can carry 4200 newspapers. By rounding all values to one significant figure, estimate the total number of deliveries needed each day, assuming each van is fully loaded where possible.	A ticket to a school talent show costs $\$4.33$ The venue has 17 rows of seats. Each row has 28 seats. The venue sells all the tickets. By rounding all values to one significant figure, estimate the total earnings of the venue.

Worked Example	Your Turn
Estimate: a) $354 \div 6.9$ b) $\sqrt{17} \times 14$	Estimate: a) $357 \div 8.9$ b) $\frac{\sqrt{150}}{3}$

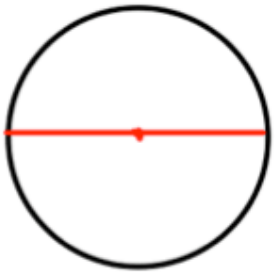
Worked Example	Your Turn
Estimate: a) $\sqrt{110}$ b) $\sqrt[3]{100}$ Give your answers to 1 decimal place.	Estimate: a) $\sqrt{20}$ b) $\sqrt[3]{140}$ Give your answers to 1 decimal place.

2 Circles

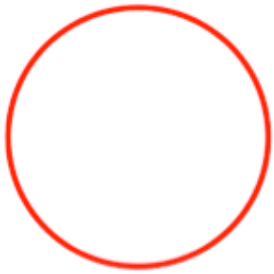
2.1 Parts of the Circle



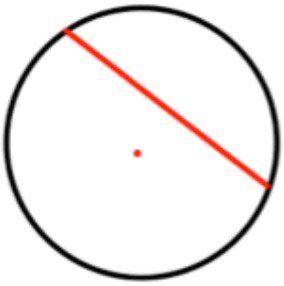
Radius



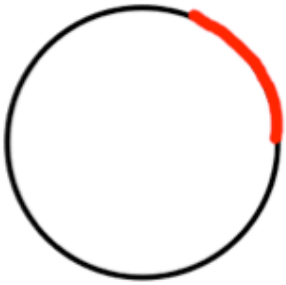
Diameter



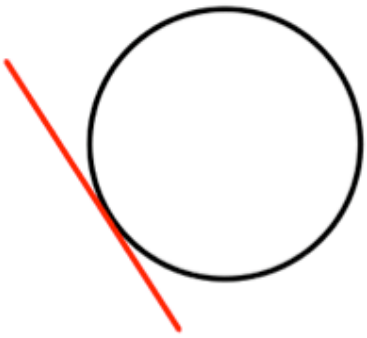
Circumference



Chord



Arc



Tangent

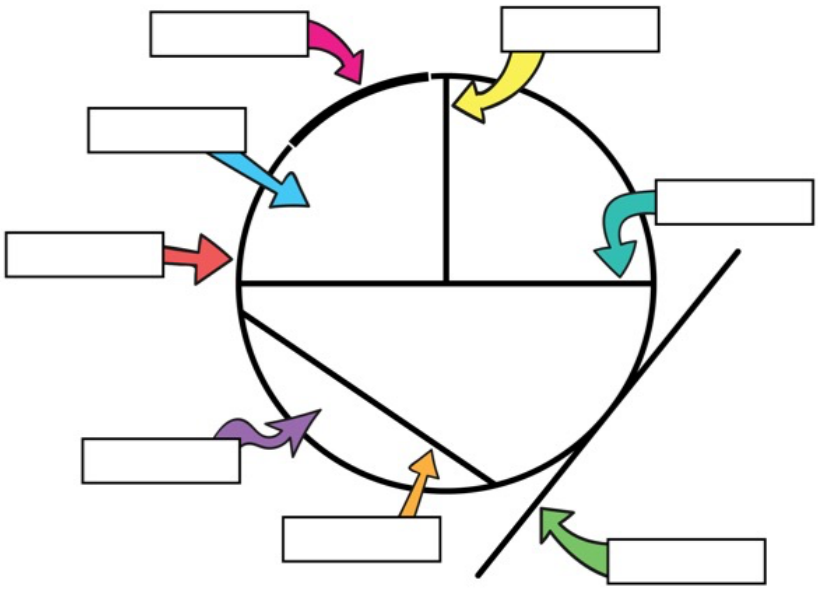
Segment

Sector

Fluency Practice

Labelling parts of a circle

Use the words below to label each part of the circle correctly



Arc | Chord | Circumference | Diameter | Radius | Sector | Segment | Tangent

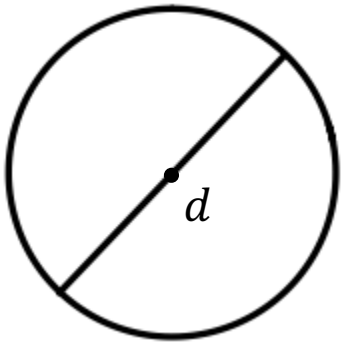
Circle Vocabulary: Match each word with its definition.

Arc	Line joining two points on a circumference.
Segment	Perimeter of a circle.
Chord	Part of a circle between a chord and an arc.
Radius	Line touching the circumference of a circle once.
Diameter	Distance from the centre of a circle to the edge.
Circumference	Part of the circumference of a circle.
Tangent	Part of a circle between two radii and an arc.
Sector	Width of a circle.

2.2 Circumference of Circles

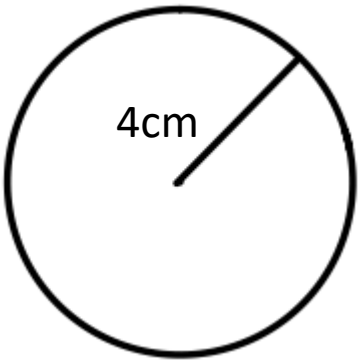
The circumference is the perimeter of a circle.

$$\text{Circumference} = \pi \times \text{diameter}$$
$$C = \pi d$$



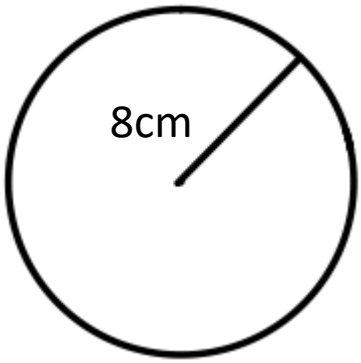
Worked Example

Calculate the circumference of the circle below. Give your answer in terms of π and to 1 decimal place.



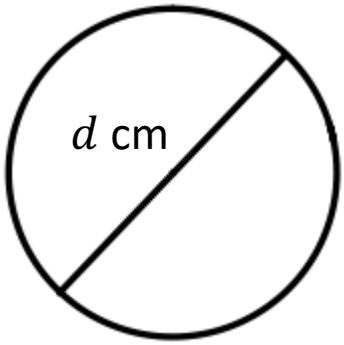
Your Turn

Calculate the circumference of the circle below. Give your answer in terms of π and to 1 decimal place.



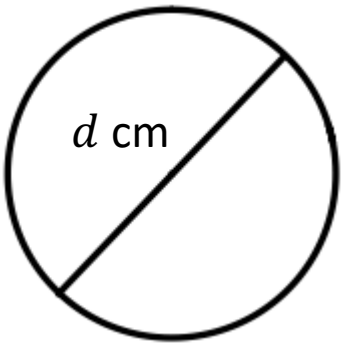
Worked Example

Calculate the diameter, d, of the circle below given that the circumference is 12.6 cm. Give your answer to 2 decimal places.

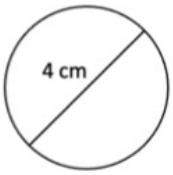
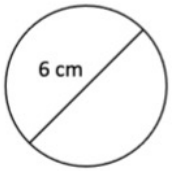
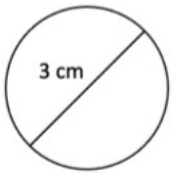
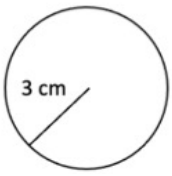
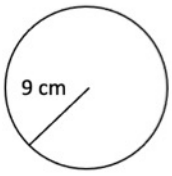


Your Turn

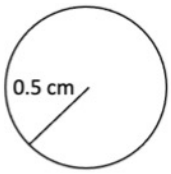
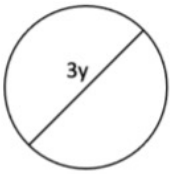
Calculate the diameter, d, of the circle below given that the circumference is 25.1 cm. Give your answer to 2 decimal places.



Fill in the Gaps

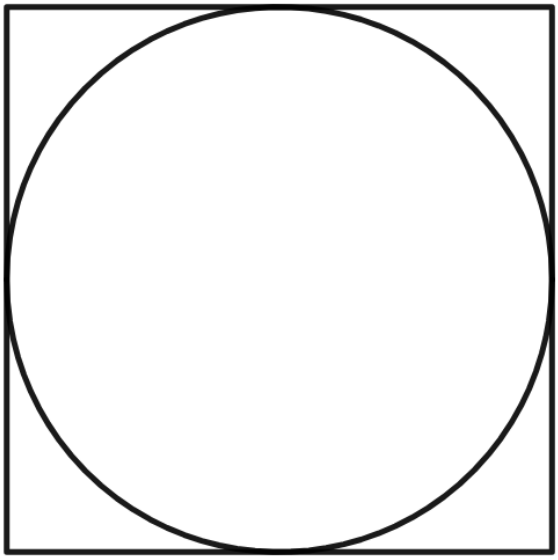
Diagram	Radius	Diameter	Calculation	Circumference (in terms of π)	Circumference (1 dp)
					
					
					
					
					
		12 mm			
	5 m				

Fill in the Gaps

Diagram	Radius	Diameter	Calculation	Circumference (in terms of π)	Circumference (1 dp)
				16π km	
					
					
	$5a$				

Worked Example

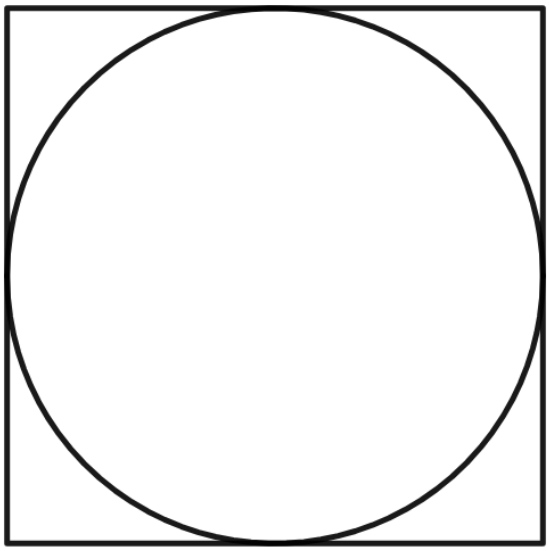
The area of the square is 25 cm^2.



Work out the circumference of the circle. Give your answer to 1 decimal place.

Your Turn

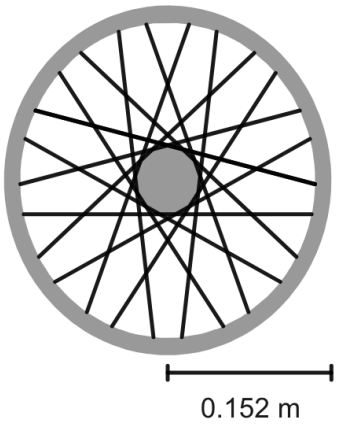
The area of the square is 8 m^2.



Work out the circumference of the circle. Give your answer to 1 decimal place.

Worked Example

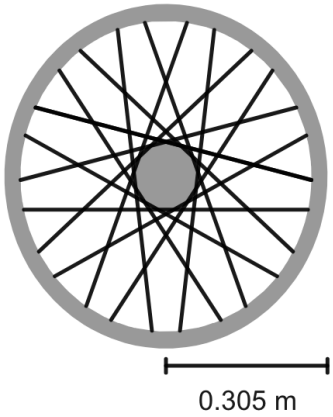
Omar has a bicycle with a wheel radius of 0.152 m.



He rides for 1600 metres. Calculate how many full turns the wheel makes during his ride.

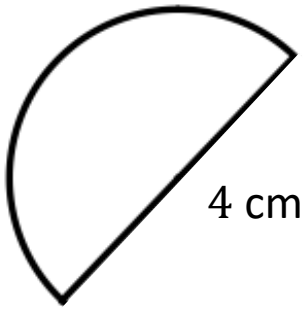
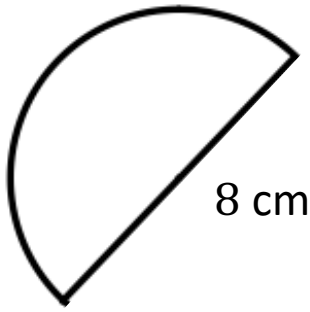
Your Turn

Connor has a bicycle with a wheel radius of 0.305 m.



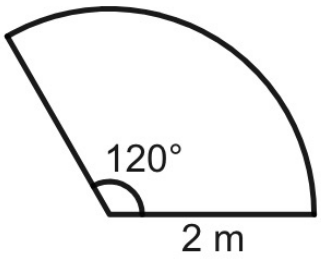
He rides for 1400 metres. Work out how many full turns the wheel needs to make to cover the whole distance.

2.3 Perimeter of Fractions of Circles

Worked Example	Your Turn
Calculate the perimeter of the semi-circle below. Give your answer in terms of π and to 1 decimal place.  	Calculate the perimeter of the semi-circle below. Give your answer in terms of π and to 1 decimal place. 

Worked Example

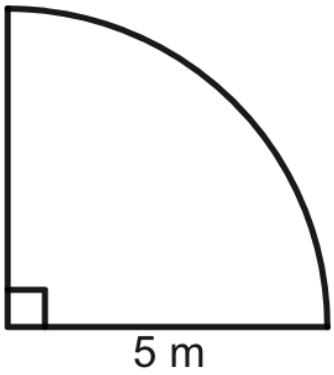
Calculate the perimeter of the shape drawn below.



Give your answer correct to 1 decimal place.

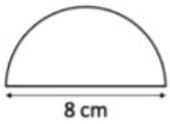
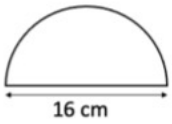
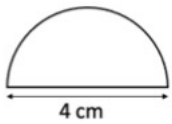
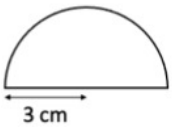
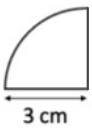
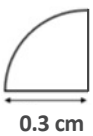
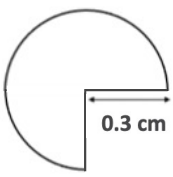
Your Turn

Calculate the perimeter of the shape drawn below.



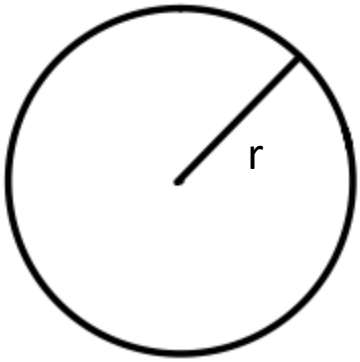
Give your answer correct to 1 decimal place.

Fill in the Gaps

Diagram	Radius	Diameter	Calculation	Perimeter (in terms of π)	Perimeter (1 dp)
					
					
					
					
					
					
					

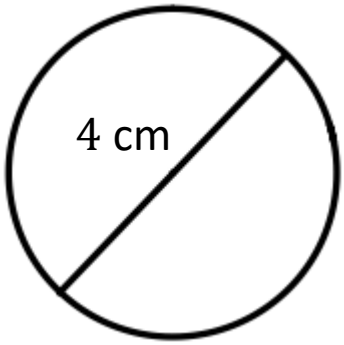
2.4 Area of Circles

$$\text{Area} = \pi \times \text{radius}^2$$
$$A = \pi r^2$$



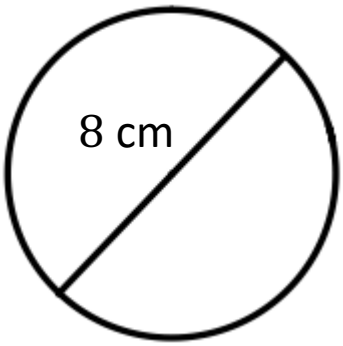
Worked Example

Calculate the area of the circle below. Give your answer in terms of π and to 1 decimal place.



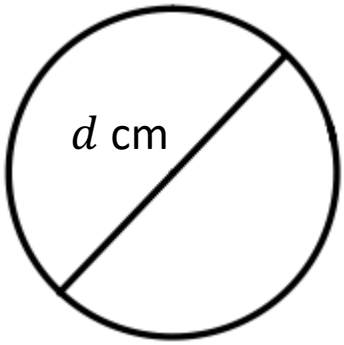
Your Turn

Calculate the area of the circle below. Give your answer in terms of π and to 1 decimal place.



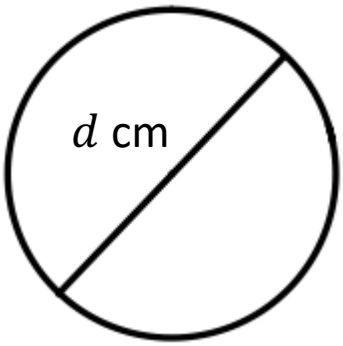
Worked Example

Calculate the diameter, d, of the circle below given that the area is $12.6\ cm^2$. Give your answer to 2 decimal places.

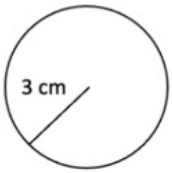
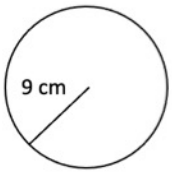
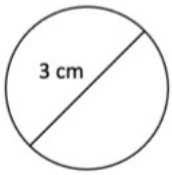
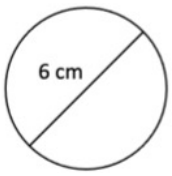
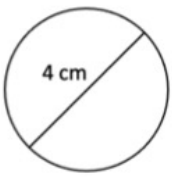


Your Turn

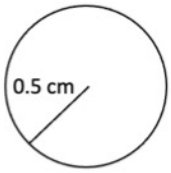
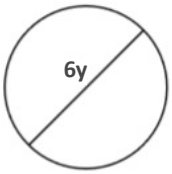
Calculate the diameter, d, of the circle below given that the area is $50.3\ cm^2$. Give your answer to 2 decimal places.



Fill in the Gaps

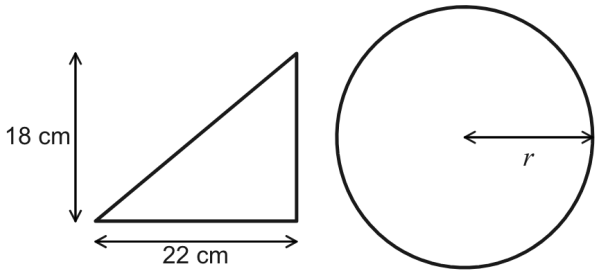
Diagram	Radius	Diameter	Calculation	Area (in terms of π)	Area (1 dp)
					
					
					
					
					
	6 mm				
		10 m			

Fill in the Gaps

Diagram	Radius	Diameter	Calculation	Area (in terms of π)	Area (1 dp)
				16π km^2	
					
	$5a$				
					

Worked Example

The diagram shows a triangle and a circle. The area of the circle is triple the area of the triangle.

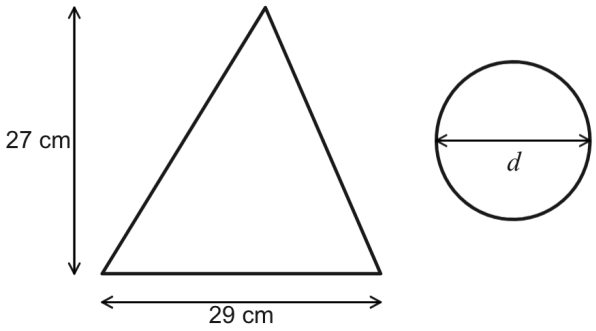


Find the radius of the circle, marked r

Give your answer correct to 2 decimal places.

Your Turn

The diagram shows a triangle and a circle. The area of the circle is half the area of the triangle.



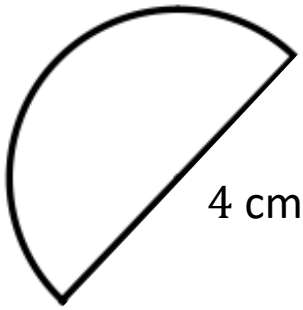
Find the diameter of the circle, marked d

Give your answer correct to 2 decimal places.

2.5 Area of Fractions of Circles

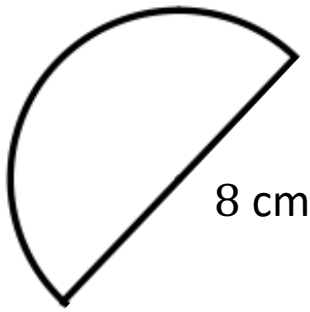
Worked Example

Calculate the area of the semi-circle below. Give your answer in terms of π and to 1 decimal place.



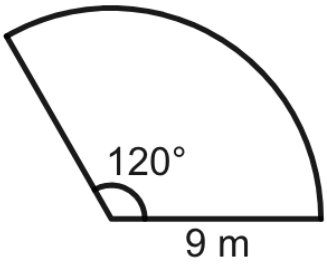
Your Turn

Calculate the area of the semi-circle below. Give your answer in terms of π and to 1 decimal place.



Worked Example

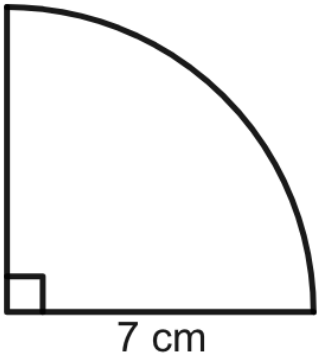
Calculate the area of the shape drawn below.



Give your answer correct to 1 decimal place.

Your Turn

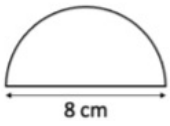
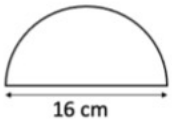
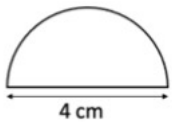
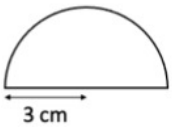
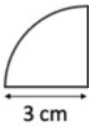
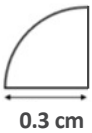
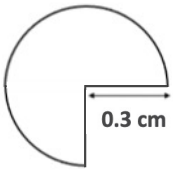
Calculate the area of the shape drawn below.



Give your answer correct to 1 decimal place.

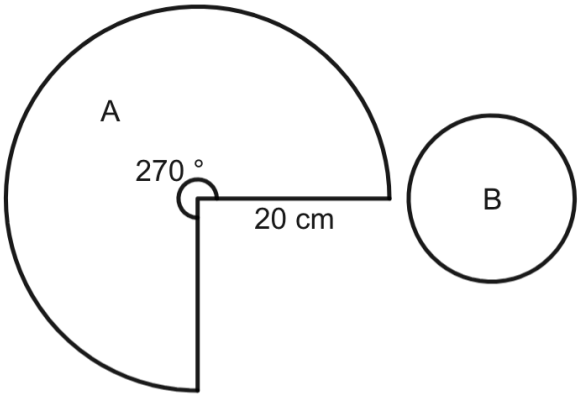
Dr Frost 211a and 211c

Fill in the Gaps

Diagram	Radius	Diameter	Calculation	Area (in terms of π)	Area (1 dp)
					
					
					
					
					
					
					

Worked Example

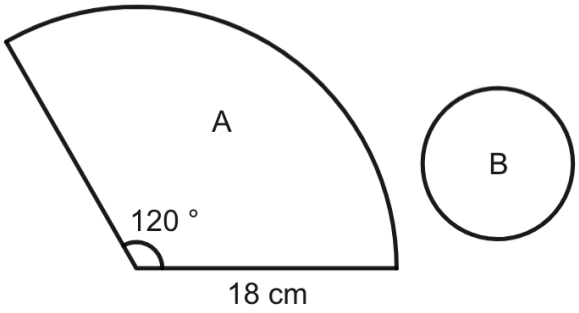
Shape A is a sector with angle $270°$ and radius 20 cm. Shape B is a circle. The area of A is 3 times the area of B.



Calculate the radius of shape B.

Your Turn

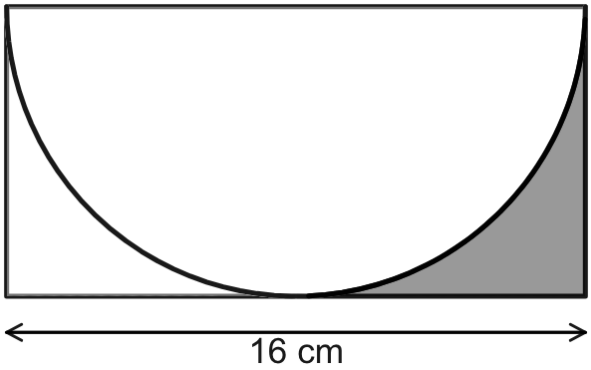
Shape A is a sector with angle $120°$ and radius 18 cm. Shape B is a circle. The area of A is 3 times the area of B.



Work out the radius of shape B.

Worked Example

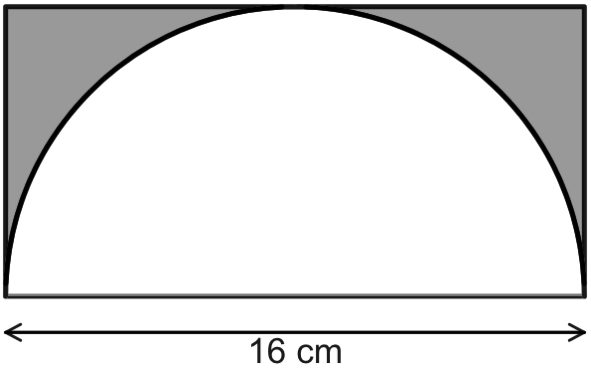
Work out the shaded area of the shape below.



Give your answer correct to 3 significant figures.

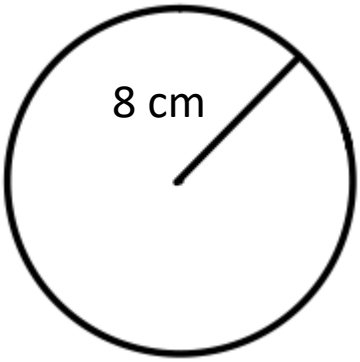
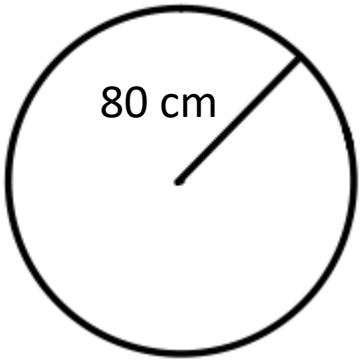
Your Turn

Work out the shaded area of the shape below.



Give your answer correct to 3 significant figures.

2.6 Area and Circumference of Circles

Worked Example	Your Turn
	
Circumference =	Circumference =
Area =	Area =

Fill in the Gaps

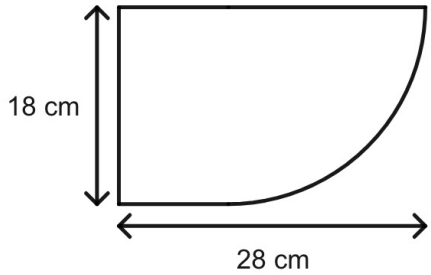
Round all answers to 1 decimal place. Remember to give units.

Radius	Diameter	Circumference	Area
$3\ cm$	$6\ cm$		$28.3\ cm^2$
$7\ cm$	$14\ cm$	$44.0\ cm$	
$5\ mm$			$78.5\ mm^2$
	$2.4\ m$	$7.5\ m$	
$4.5\ cm$	$9\ cm$		
$6\ cm$			
	$8\ cm$		
	$40\ mm$		
$0.7\ m$			
		$49.0\ cm$	$191.1\ cm^2$
		$100.5\ mm$	$804.2\ mm^2$
		$81.7\ m$	$530.9\ m^2$
		$11.3\ cm$	
		$147.0\ mm$	
			$38.5\ m^2$
			$498.8\ cm^2$

2.7 Area and Perimeter of Compound Shapes

Worked Example

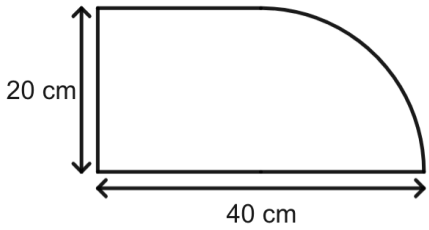
Logan designs a new badge. The design is based on a rectangle and a quadrant as shown in the diagram.



They decide to put silver thread around the badge. Calculate the length of silver thread they need. Give your answer to 2 decimal places.

Your Turn

John designs a new badge. The design is based on a rectangle and a quadrant as shown in the diagram.

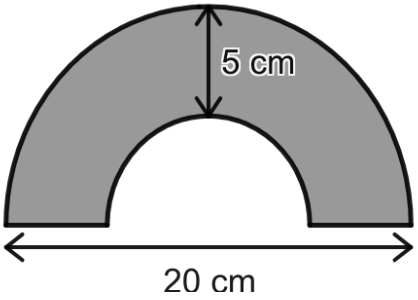


They decide to put silver thread around the badge. Calculate the length of silver thread they need. Give your answer to 2 decimal places.

Dr Frost 212b and 212a

Worked Example

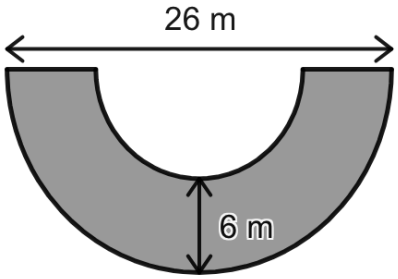
The diagram contains two concentric semi-circles.



Calculate the shaded area.
Give your answer to 1 decimal place.

Your Turn

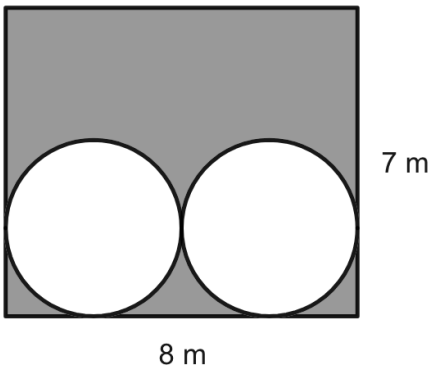
The diagram contains two concentric semi-circles.



Calculate the shaded area.
Give your answer to 1 decimal place.

Worked Example

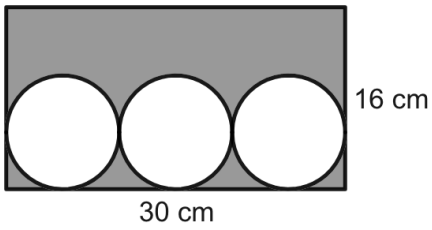
The diagram shows two circles enclosed in a rectangle.



Calculate the shaded area.
Give your answer correct to 1 decimal place.

Your Turn

The diagram shows three circles enclosed in a rectangle.

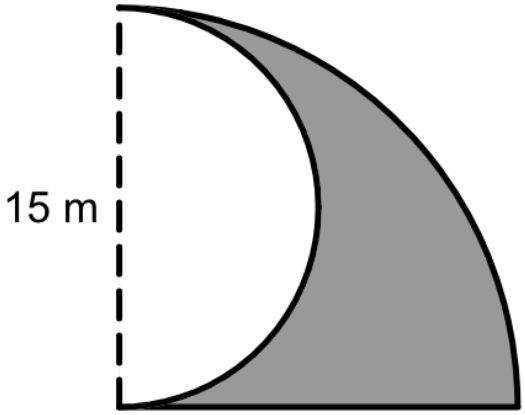


Calculate the shaded area.
Give your answer correct to 1 decimal place.

Dr Frost 213d, 213e and 213c

Worked Example

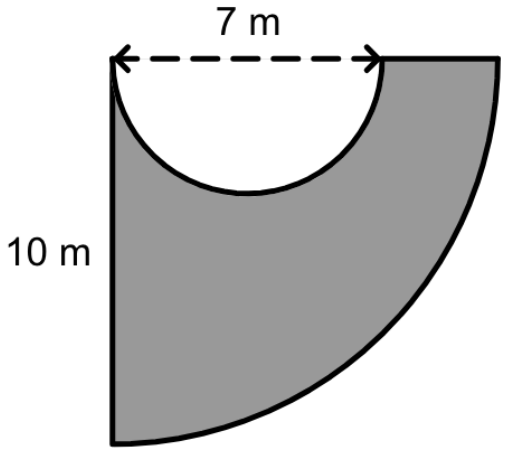
The diagram shows a semicircle cut from a quarter circle.



Find the shaded area. Give your answer correct to 1 decimal place.

Your Turn

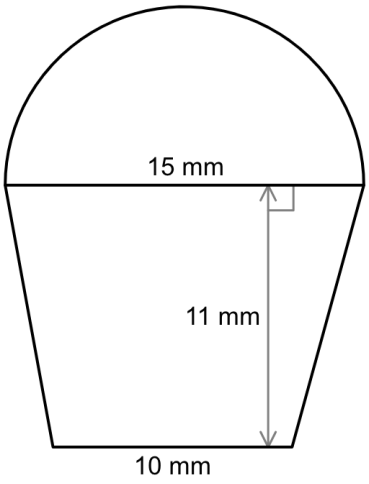
The diagram shows a semicircle cut from a quarter circle.



Find the shaded area. Give your answer correct to 1 decimal place.

Worked Example

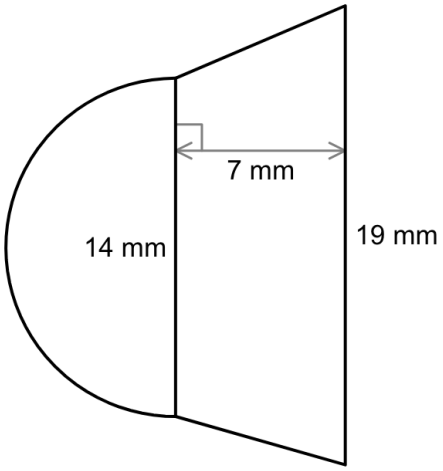
The diagram shows a shape made from a trapezium and a semicircle.



Work out the area of the shape. Give your answer correct to one decimal place.

Your Turn

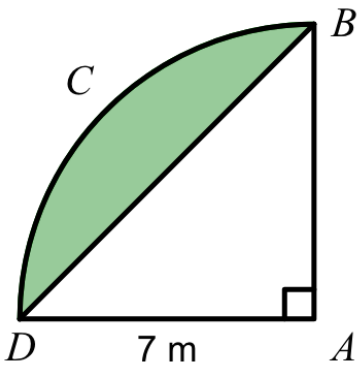
The diagram shows a shape made from a trapezium and a semicircle.



Work out the area of the shape. Give your answer correct to one decimal place.

Worked Example

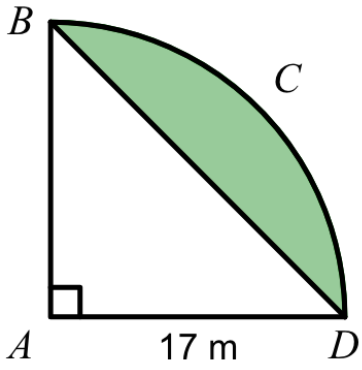
The diagram shows a sector of a circle, $ABCD$ centre A and radius 7 m.



Work out the area of the shaded segment. Give your answer correct to 1 decimal place.

Your Turn

The diagram shows a sector of a circle, $ABCD$ centre A and radius 17 m.



Work out the area of the shaded segment. Give your answer correct to 1 decimal place.

3 Angles in Parallel Lines

3.1 Transversals

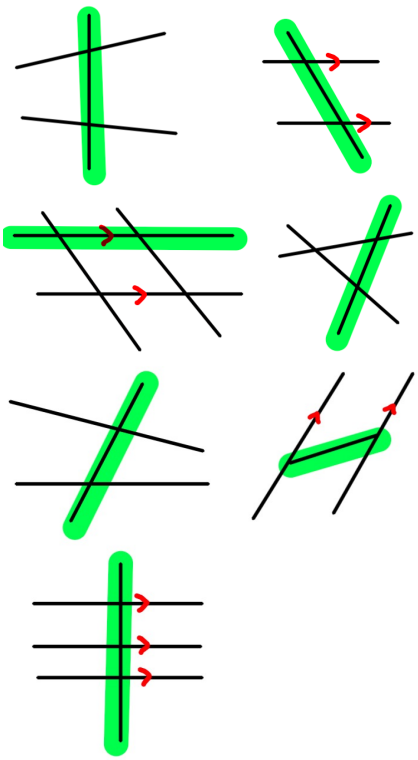
Definition

A transversal is a line that crosses or touches at least two other lines at different points.

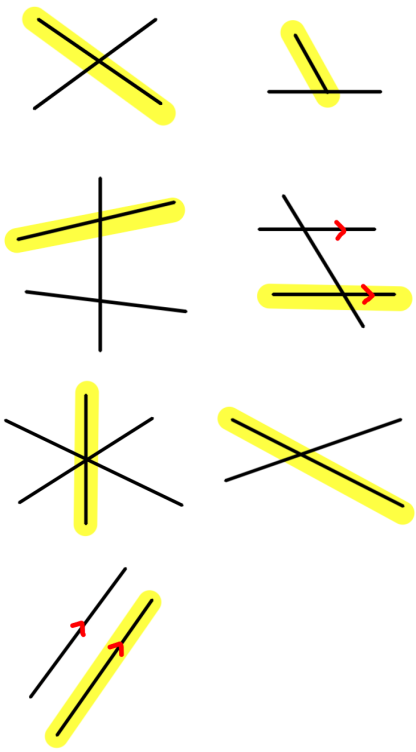
Characteristics

- The lines must be straight.
- The lines don't have to be parallel.
- From the Latin word ‘transversus’ meaning 'lying across’.

Examples



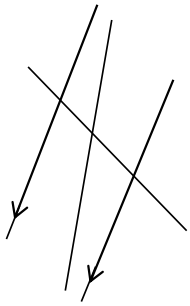
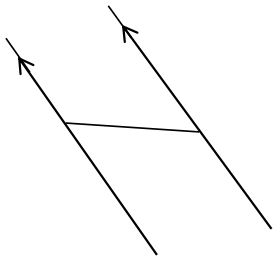
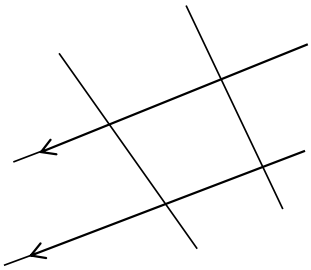
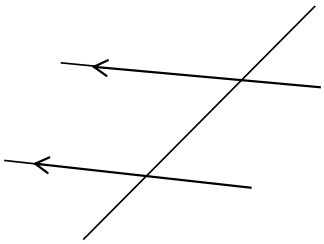
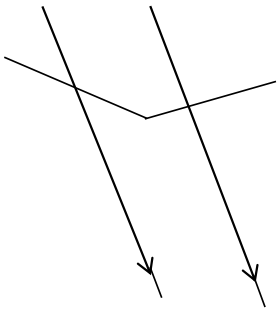
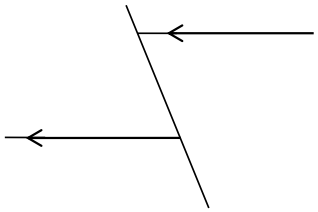
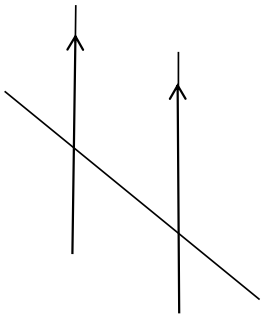
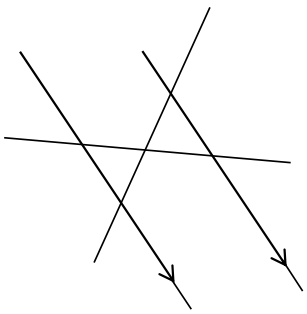
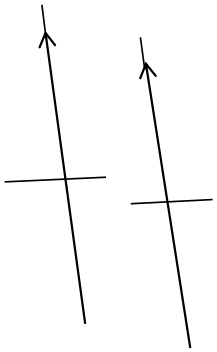
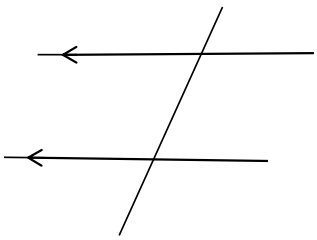
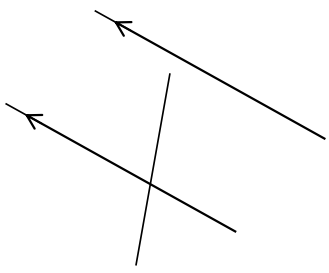
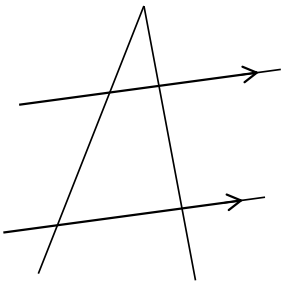
Non-Examples



Fluency Practice

The diagrams are not drawn accurately

Highlight any transversals

3.2 Corresponding Angles

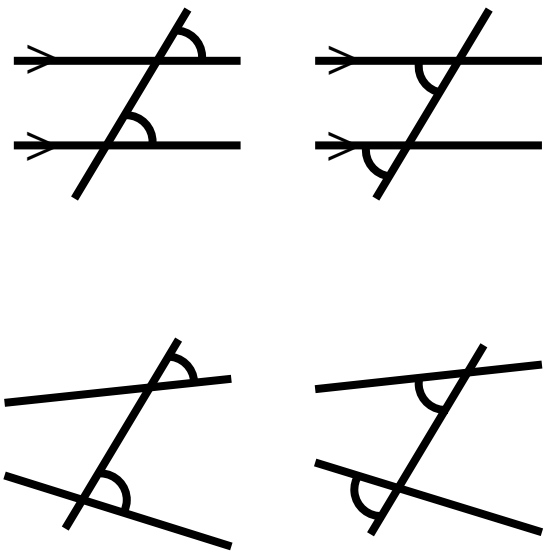
Definition

Corresponding angles are on the same side of the transversal and in corresponding positions in relation to the lines the transversal crosses or touches.

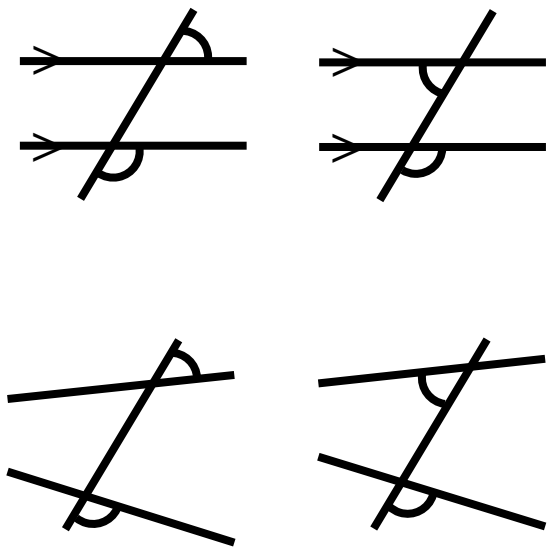
Characteristics

- The lines must be straight.
- The lines don't have to be parallel.
- Corresponding positions means matching positions – above/below or left/right.

Examples



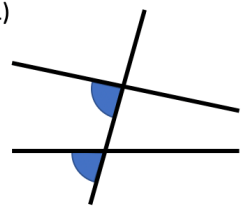
Non-Examples



Fluency Practice

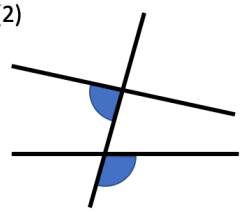
For each question, write either ***'corresponding'*** or ***'not corresponding'*** on the line.

(1)



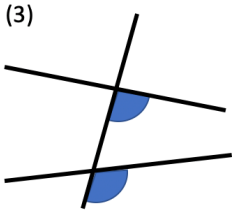
These angles are _____.

(2)



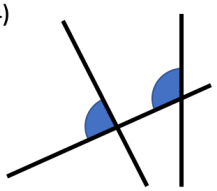
These angles are _____.

(3)



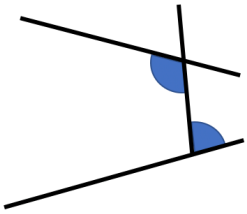
These angles are _____.

(4)



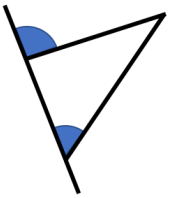
These angles are _____.

(5)



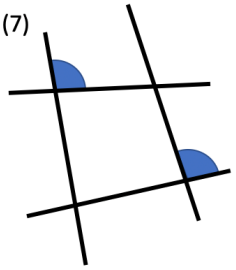
These angles are _____.

(6)



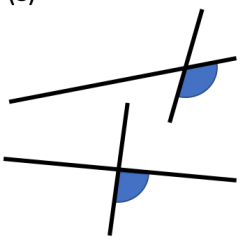
These angles are _____.

(7)



These angles are _____.

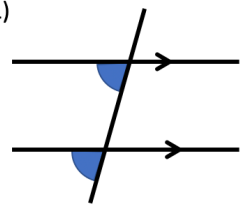
(8)



These angles are _____.

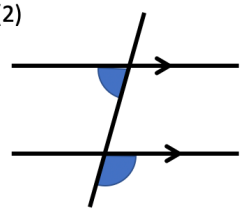
For each question, write either ***'corresponding'*** or ***'not corresponding'*** on the line.

(1)



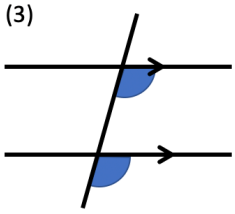
These angles are _____.

(2)



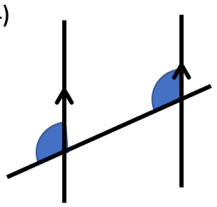
These angles are _____.

(3)



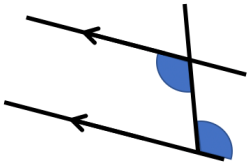
These angles are _____.

(4)



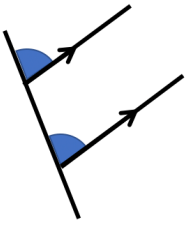
These angles are _____.

(5)



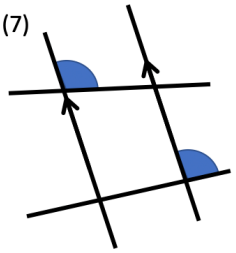
These angles are _____.

(6)



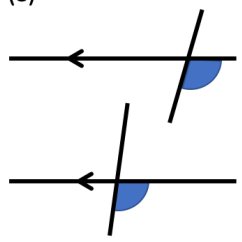
These angles are _____.

(7)



These angles are _____.

(8)

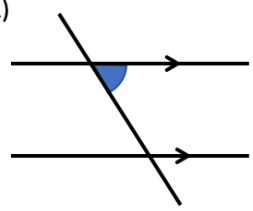


These angles are _____.

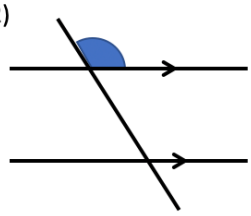
Fluency Practice

Each diagram has one angle shaded in.
Mark and shade in their corresponding angles.

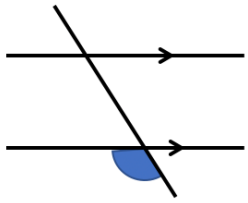
(1)



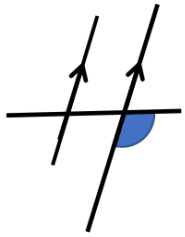
(2)



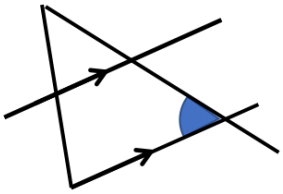
(3)



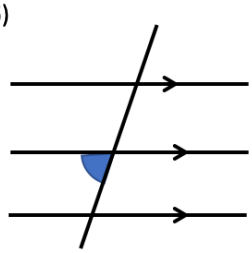
(4)



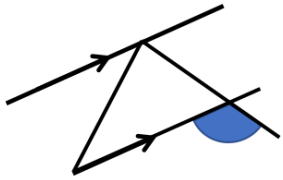
(5)



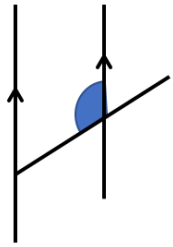
(6)



(7)

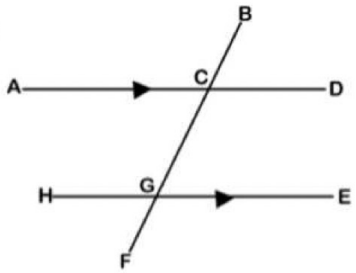


(8)

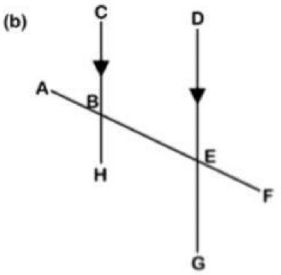


Find all the pairs of corresponding angles in each diagram.
Use three letter notation to identify the angles (e.g. "∠ACB and ∠HGC").

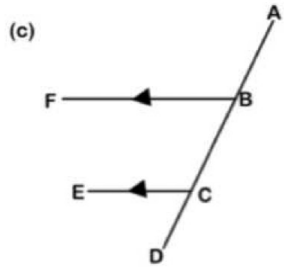
(a)



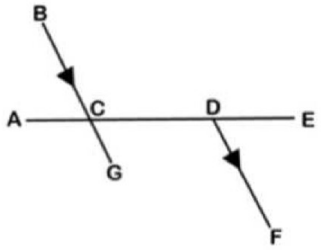
(b)



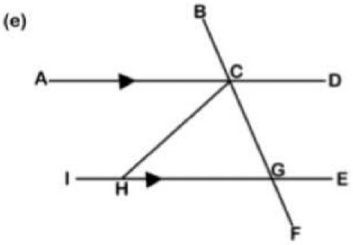
(c)



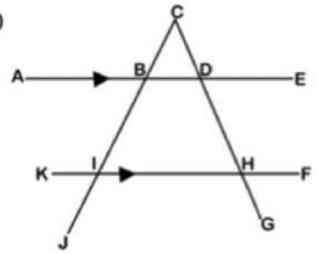
(d)



(e)

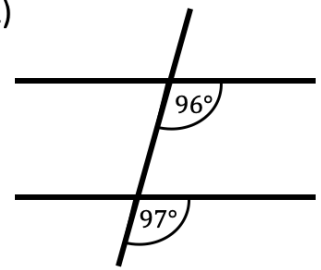


(f)

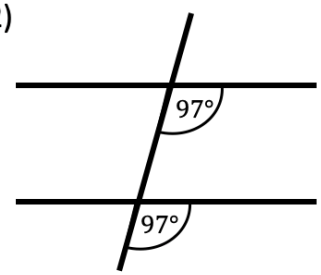


Use your knowledge of corresponding angles to decide which diagrams contain parallel lines. Explain how you made your decision for each question.

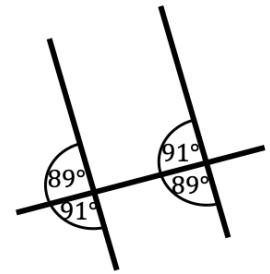
(1)



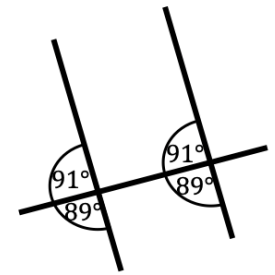
(2)



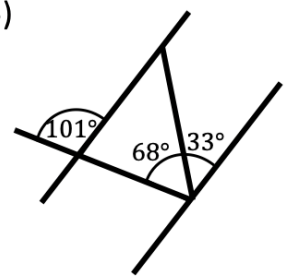
(3)



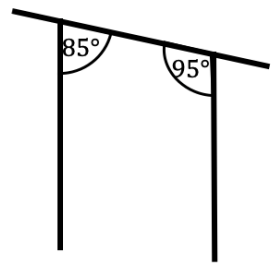
(4)



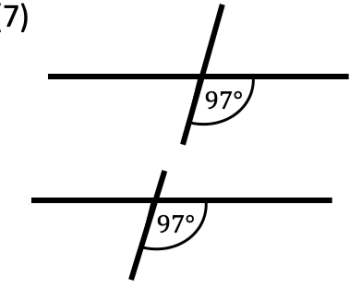
(5)



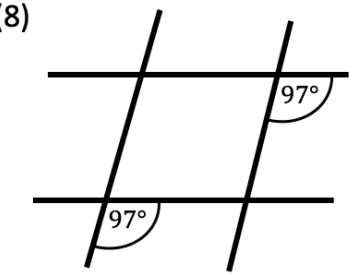
(6)



(7)



(8)



Fluency Practice

The diagrams are not drawn accurately

1. Do the diagrams show corresponding angles? Provide a reason for your answer.

a.

b.

c.

d.

e.

f.

g.

h.

2. Write down the three letter notation for any corresponding angles to the one that is marked on the diagram.

a.

b.

c.

d.

e.

f.

3. Write down the three letter notation for any pairs (or more) of corresponding angles.

a.

b.

c.

d.

e.

f.

4. Are the bold lines parallel? Provide a reason for your answer.

a.

b.

c.

d.

e.

f.

3.3 Alternate Angles

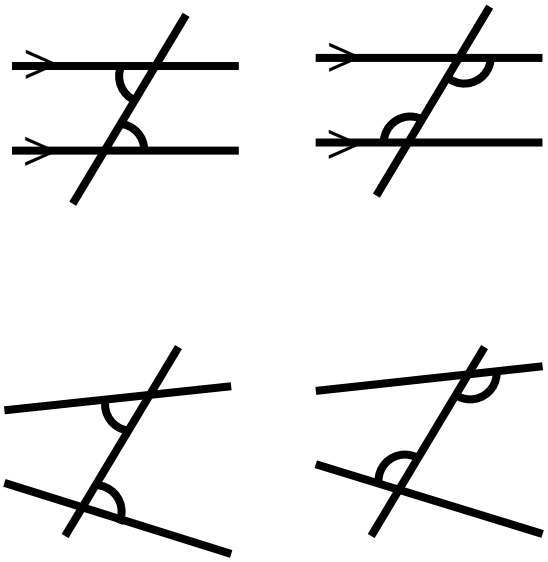
Definition

Alternate angles are on opposite sides of the transversal and between the two lines the transversal crosses or touches.

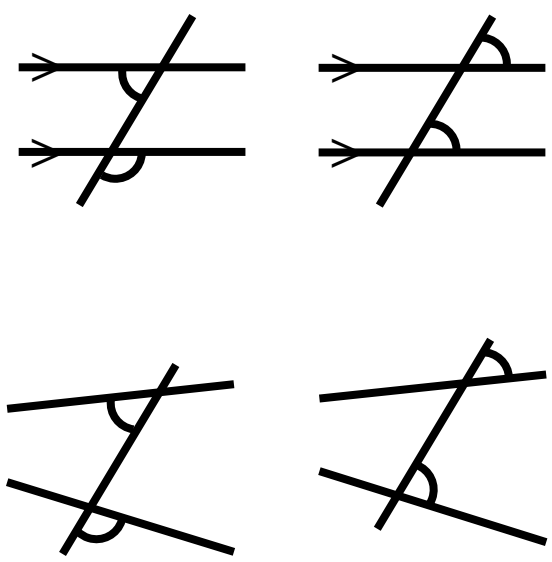
Characteristics

- The lines must be straight.
- The lines don't have to be parallel.

Examples



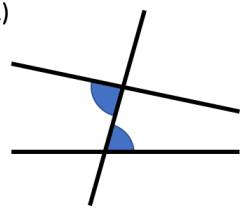
Non-Examples



Fluency Practice

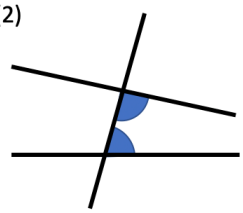
For each question, write either ***'alternate'*** or ***'not alternate'*** on the line.

(1)



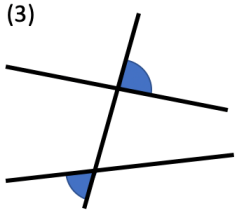
These angles are _____.

(2)



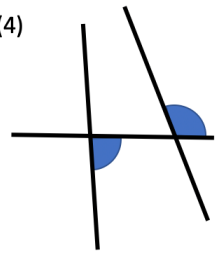
These angles are _____.

(3)



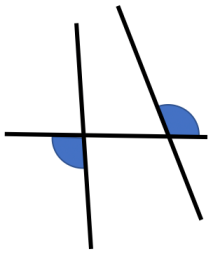
These angles are _____.

(4)



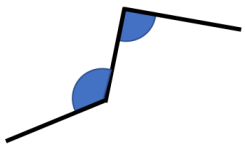
These angles are _____.

(5)



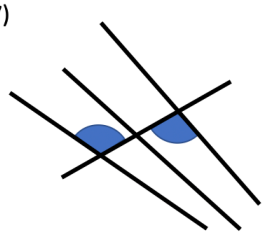
These angles are _____.

(6)



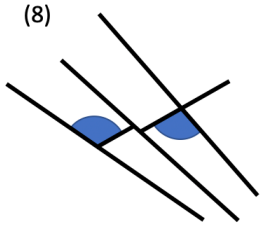
These angles are _____.

(7)



These angles are _____.

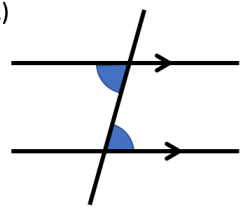
(8)



These angles are _____.

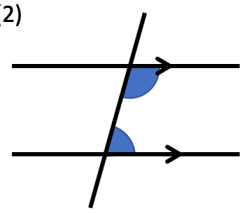
For each question, write either ***'alternate'*** or ***'not alternate'*** on the line.

(1)



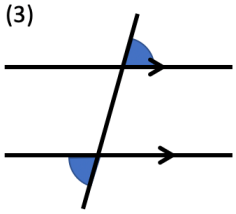
These angles are _____.

(2)



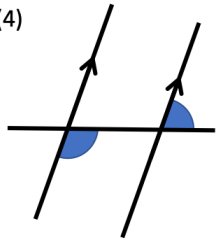
These angles are _____.

(3)



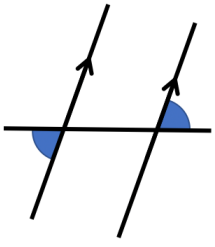
These angles are _____.

(4)



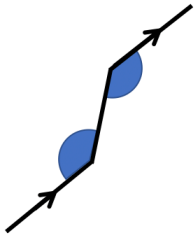
These angles are _____.

(5)



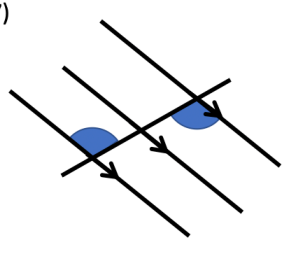
These angles are _____.

(6)



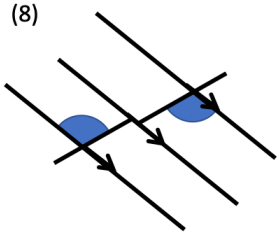
These angles are _____.

(7)



These angles are _____.

(8)

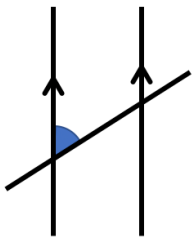


These angles are _____.

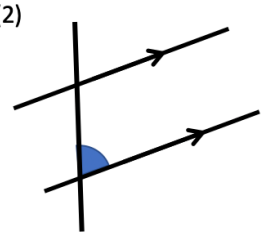
Fluency Practice

Each diagram has one angle shaded in.
Mark and shade in their alternate angles.

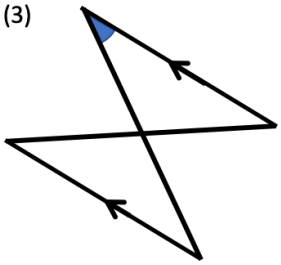
(1)



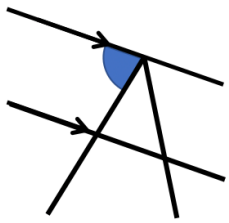
(2)



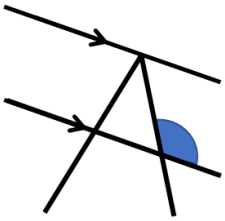
(3)



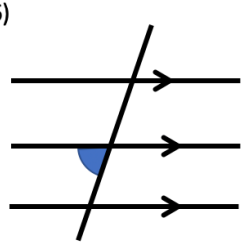
(4)



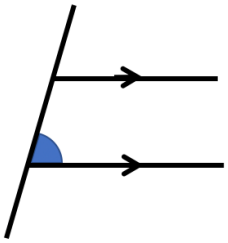
(5)



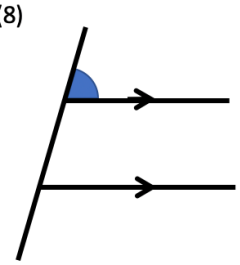
(6)



(7)

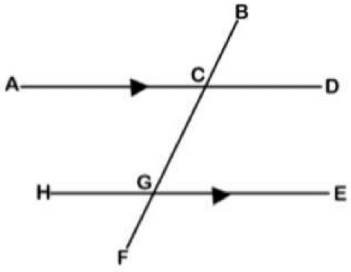


(8)

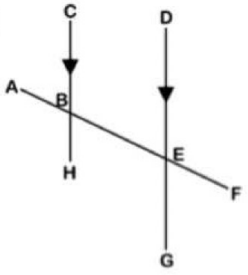


Find all the pairs of alternate angles in each diagram.
Use three letter notation to identify the angles (e.g. "∠DCG and ∠HGC").

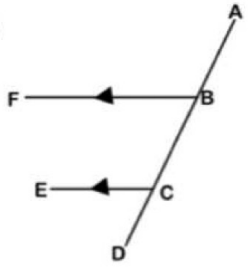
(a)



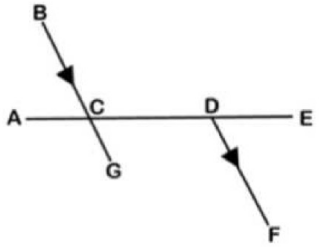
(b)



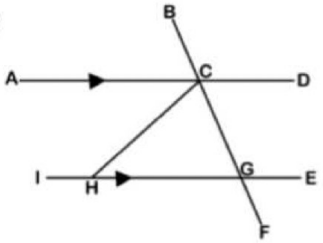
(c)



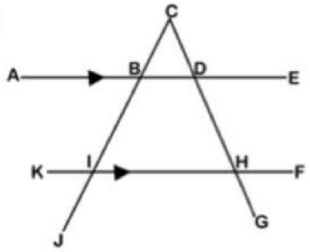
(d)



(e)

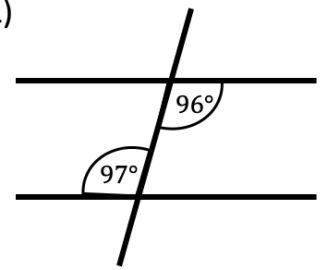


(f)

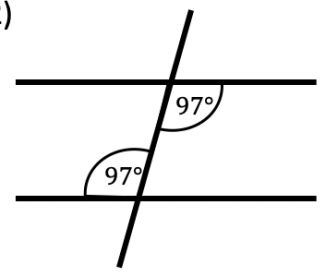


Use your knowledge of alternate angles to decide which diagrams contain parallel lines.
Explain how you made your decision for each question.

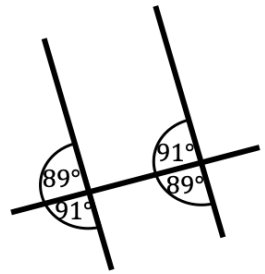
(1)



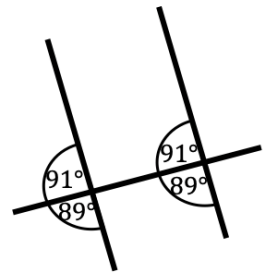
(2)



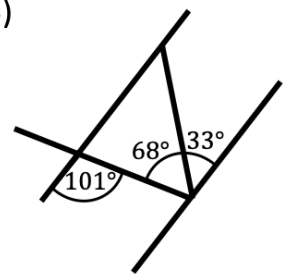
(3)



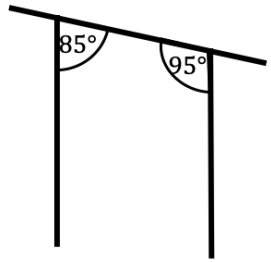
(4)



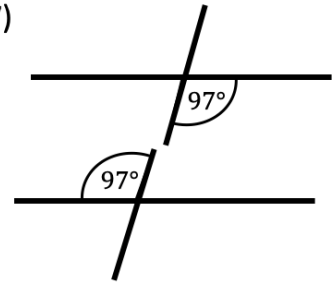
(5)



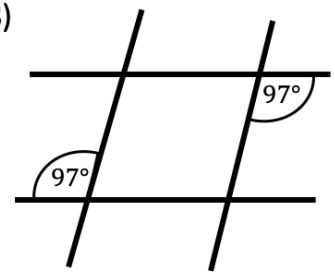
(6)



(7)

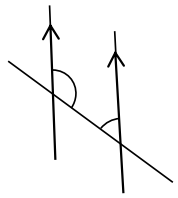


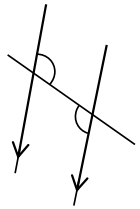
(8)

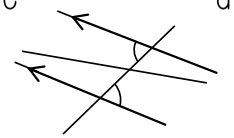


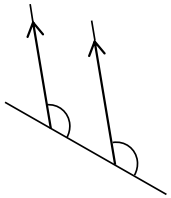
The diagrams are not drawn accurately

1. Do the diagrams show alternate angles? Provide a reason for your answer.

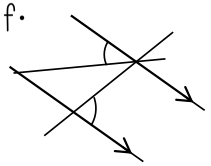
a. 

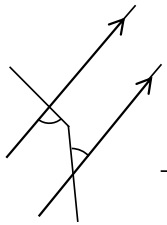
b. 

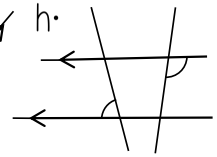
c. 

d. 

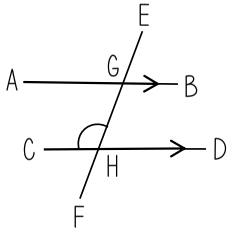
e. 

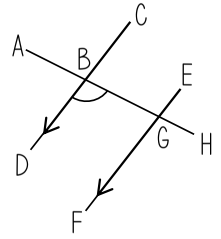
f. 

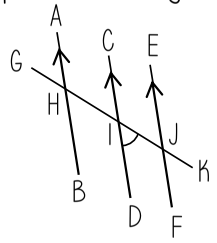
g. 

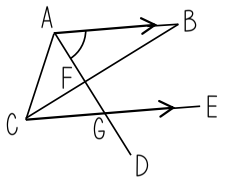
h. 

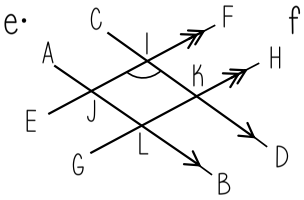
2. Write down the three letter notation for any alternate angles to the one that is marked on the diagram.

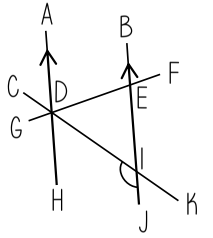
a. 

b. 

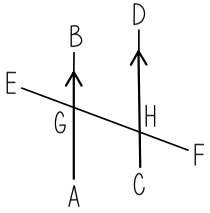
c. 

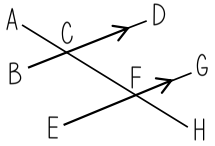
d. 

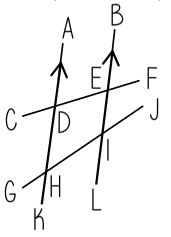
e. 

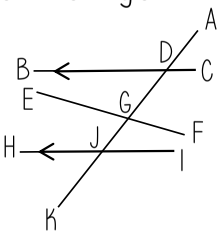
f. 

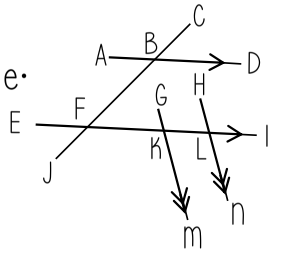
3. Write down the three letter notation for any pairs (or more) of alternate angles.

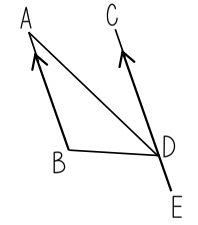
a. 

b. 

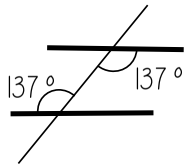
c. 

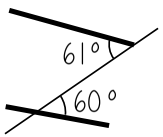
d. 

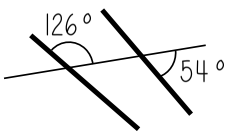
e. 

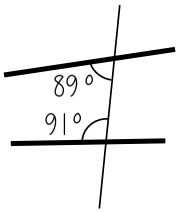
f. 

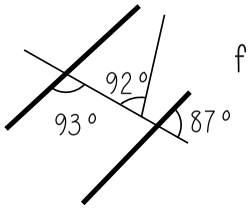
4. Are the bold lines parallel? Provide a reason for your answer.

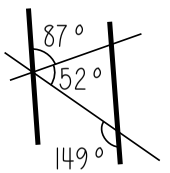
a. 

b. 

c. 

d. 

e. 

f. 

3.4 Co-Interior Angles

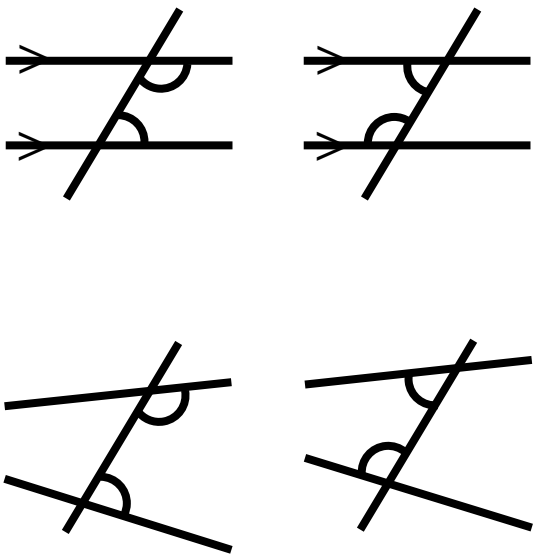
Definition

Co-interior angles are on the same side of the transversal and between the two lines the transversal crosses or touches.

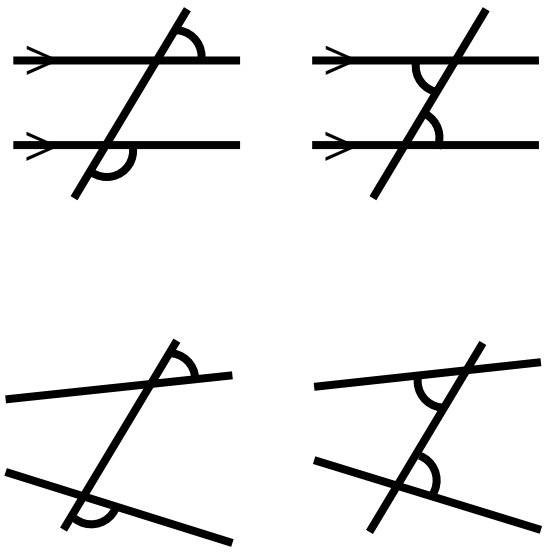
Characteristics

- The lines must be straight.
- The lines don't have to be parallel.
- Co-interior is short for consecutive interior.
- Also called allied angles.

Examples



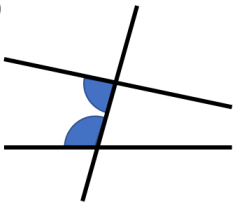
Non-Examples



Fluency Practice

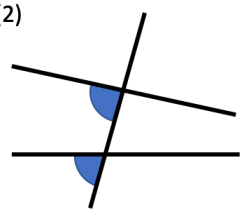
For each question, write either ***'co-interior'*** or ***'not co-interior'*** on the line.

(1)



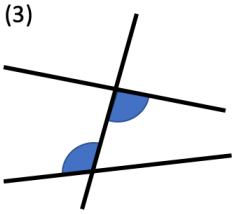
These angles are _____.

(2)



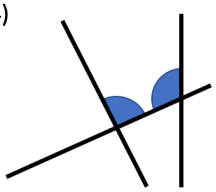
These angles are _____.

(3)



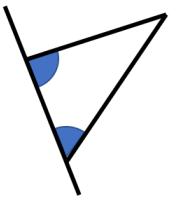
These angles are _____.

(4)



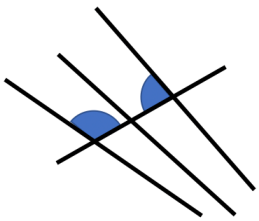
These angles are _____.

(5)



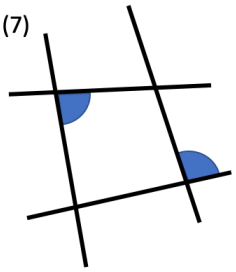
These angles are _____.

(6)



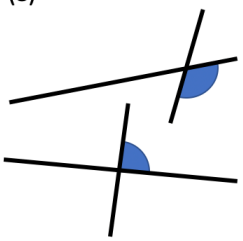
These angles are _____.

(7)



These angles are _____.

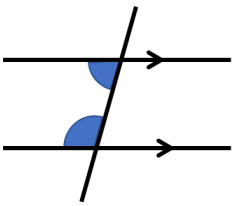
(8)



These angles are _____.

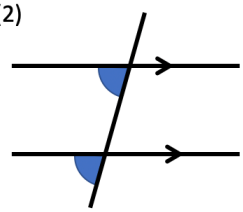
For each question, write either ***'co-interior'*** or ***'not co-interior'*** on the line.

(1)



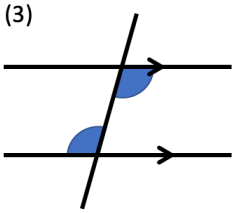
These angles are _____.

(2)



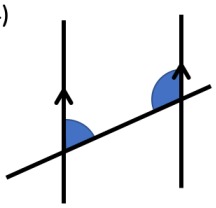
These angles are _____.

(3)



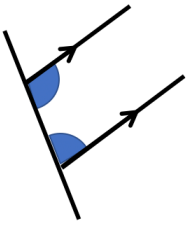
These angles are _____.

(4)



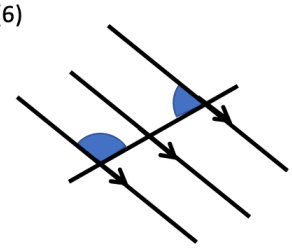
These angles are _____.

(5)



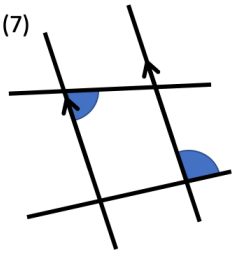
These angles are _____.

(6)



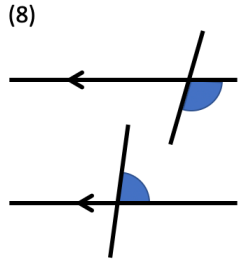
These angles are _____.

(7)



These angles are _____.

(8)

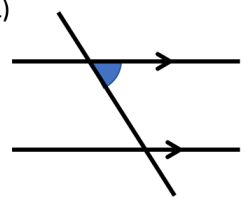


These angles are _____.

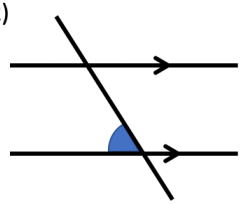
Fluency Practice

Each diagram has one angle shaded in.
Mark and shade in their co-interior angles.

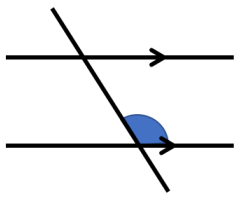
(1)



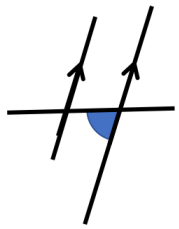
(2)



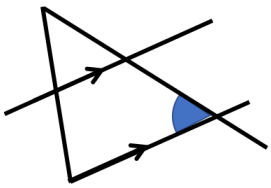
(3)



(4)



(5)



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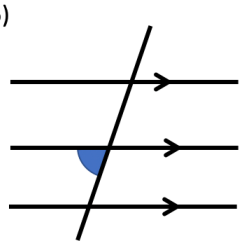
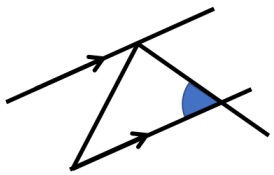
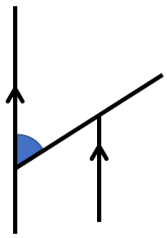


(7)

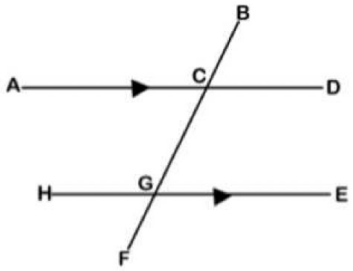


(8)

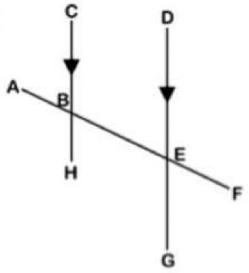


Find all the pairs of co-interior angles in each diagram.
Use three letter notation to identify the angles (e.g. "∠ACG and ∠HGC").

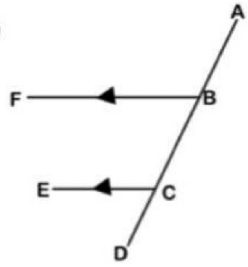
(a)



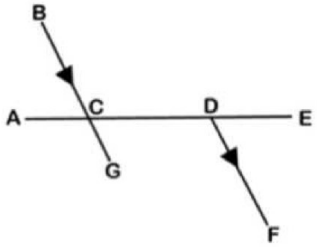
(b)



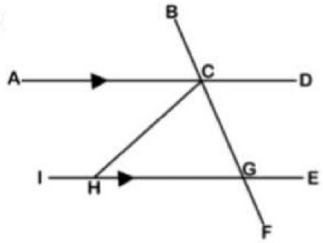
(c)



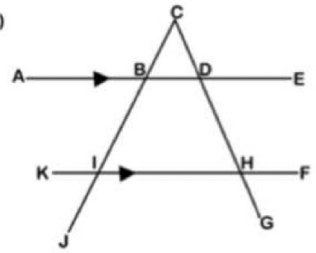
(d)



(e)

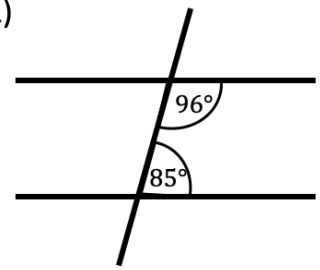


(f)

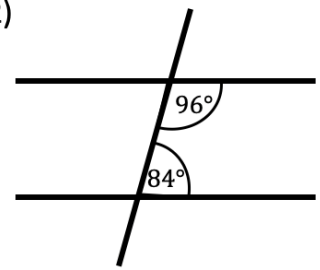


Use your knowledge of co-interior angles to decide which diagrams contain parallel lines. Explain how you made your decision for each question.

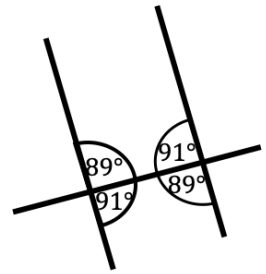
(1)



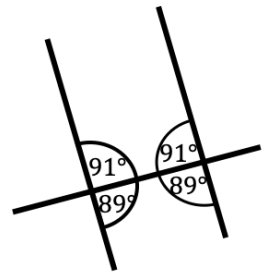
(2)



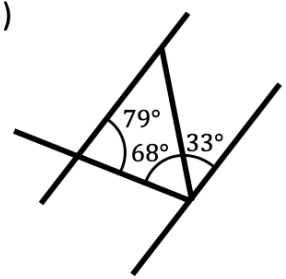
(3)



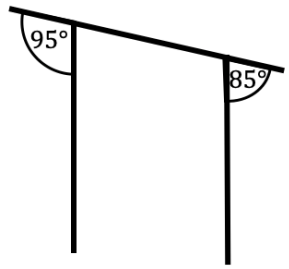
(4)



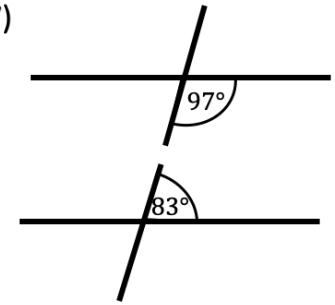
(5)



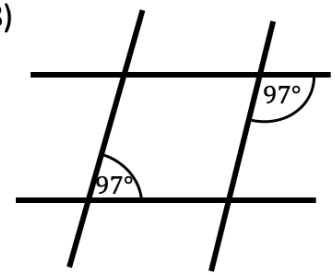
(6)



(7)

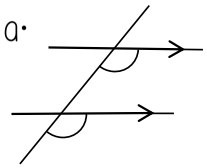


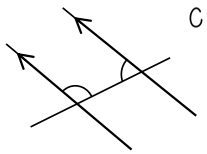
(8)

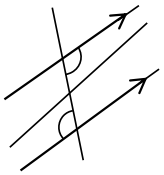


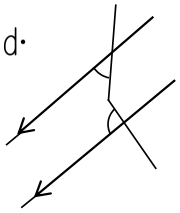
The diagrams are not drawn accurately

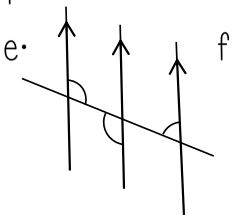
1. Do the diagrams show co-interior angles? Provide a reason for your answer.

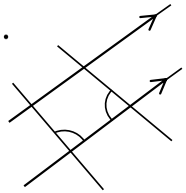
a. 

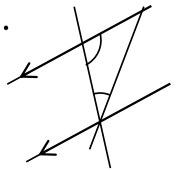
b. 

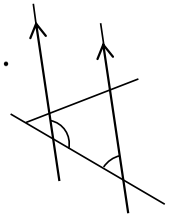
c. 

d. 

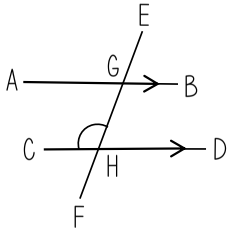
e. 

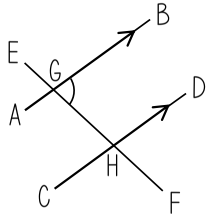
f. 

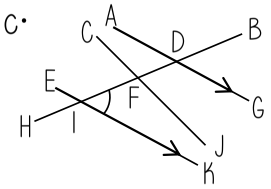
g. 

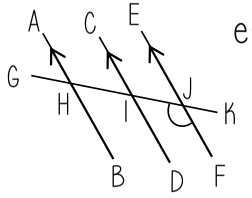
h. 

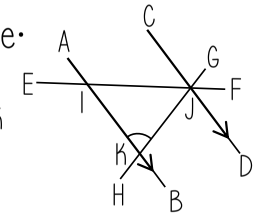
2. Write down the three letter notation for any co-interior angles to the one that is marked on the diagram.

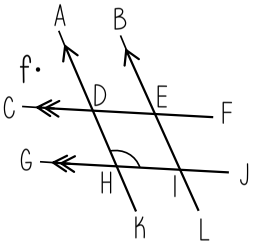
a. 

b. 

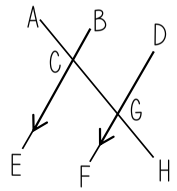
c. 

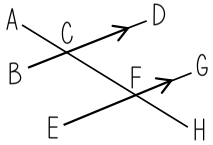
d. 

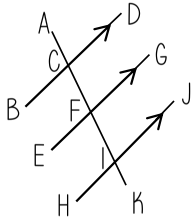
e. 

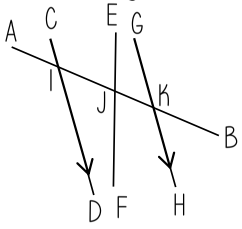
f. 

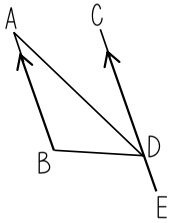
3. Write down the three letter notation for any pairs (or more) of co-interior angles.

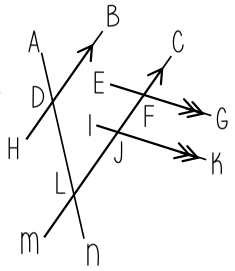
a. 

b. 

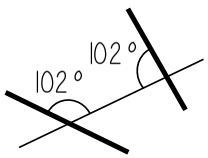
c. 

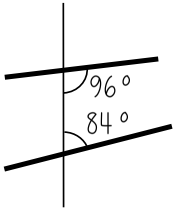
d. 

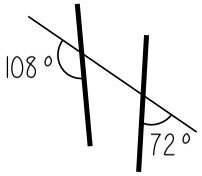
e. 

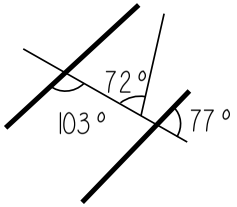
f. 

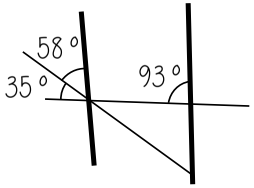
4. Are the bold lines parallel? Provide a reason for your answer.

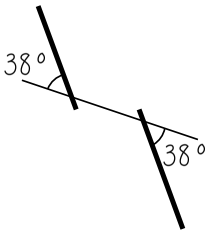
a. 

b. 

c. 

d. 

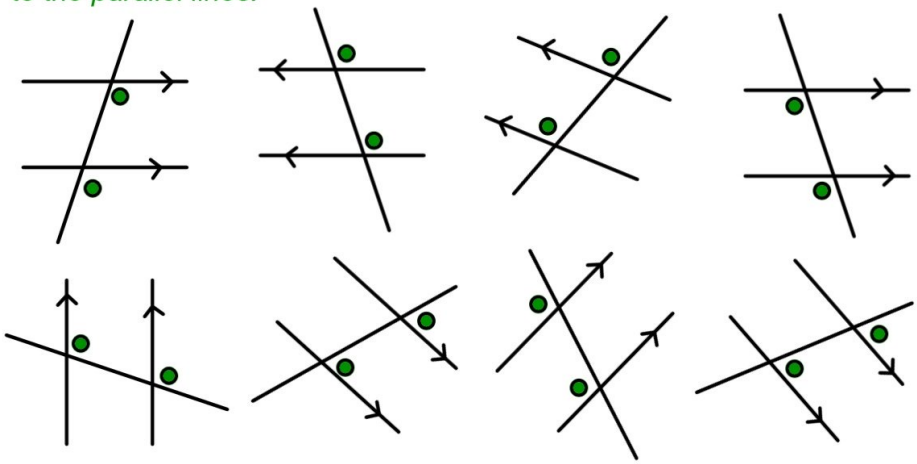
e. 

f. 

3.5 Mixed

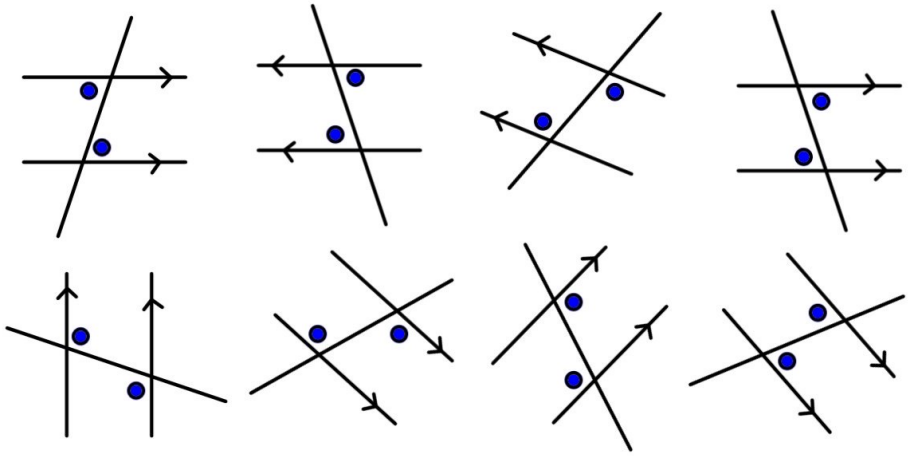
Angle Facts in Parallel Lines: *Corresponding angles are equal.*

On the same side of the transversal and in the same position in relation to the parallel lines.



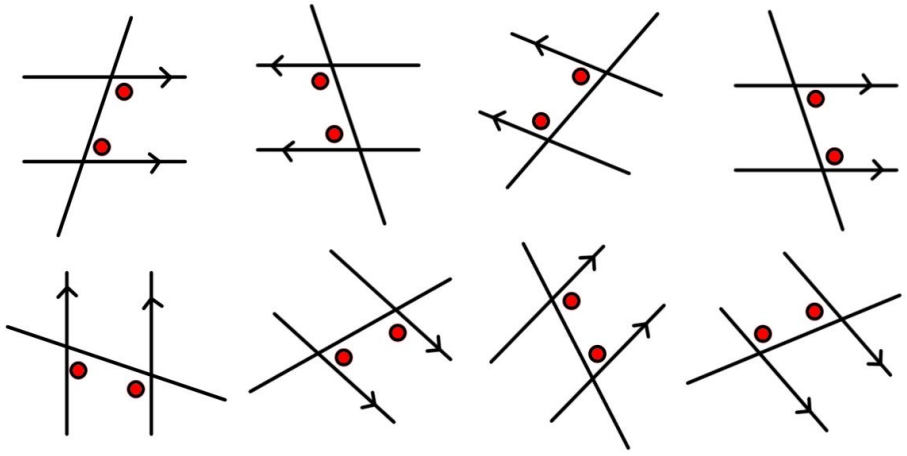
Angle Facts in Parallel Lines: *Alternate angles are equal.*

Between the parallel lines, on opposite sides of the transversal.



Angle Facts in Parallel Lines: *Co-interior angles add up to 180°.*

Between the parallel lines and on the same side of the transversal.

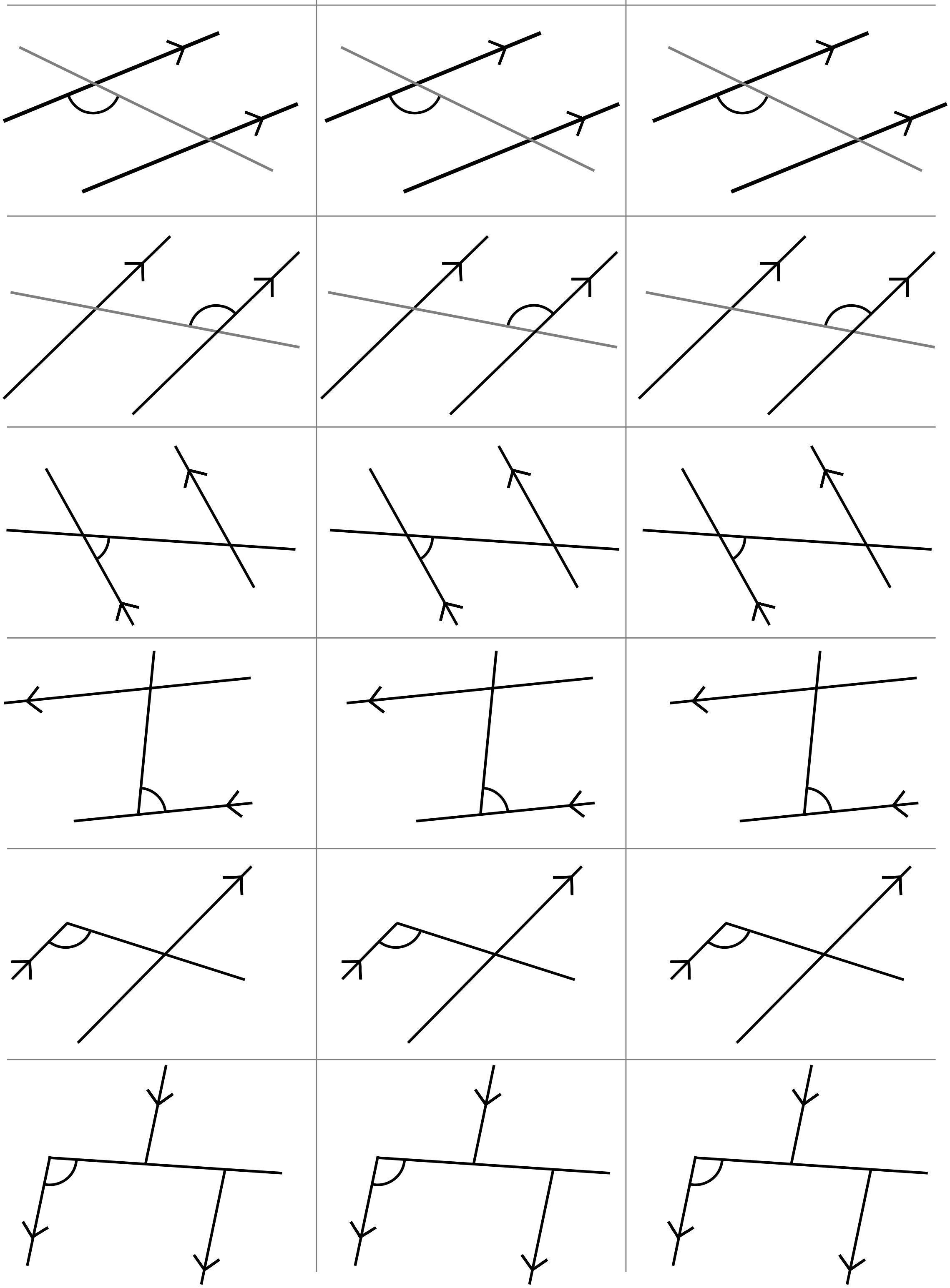


Dr Frost 262a, 262b, 262c, 262d and 262e

Fluency Practice

On each diagram, label an angle according to each rule.

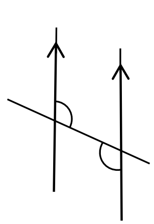
Corresponding	Alternate	Co-Interior



Fluency Practice

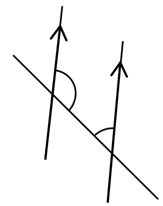
The diagrams are not drawn accurately

Decide whether the diagrams show corresponding, alternate or co-interior angles



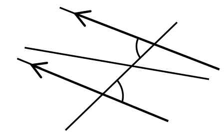
Corresponding	
Alternate	
Co-Interior	
None	

Explain how you know



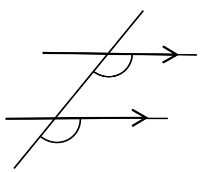
Corresponding	
Alternate	
Co-Interior	
None	

Explain how you know



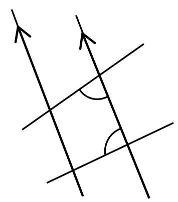
Corresponding	
Alternate	
Co-Interior	
None	

Explain how you know



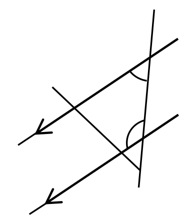
Corresponding	
Alternate	
Co-Interior	
None	

Explain how you know



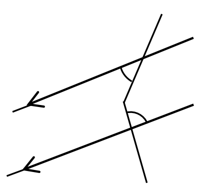
Corresponding	
Alternate	
Co-Interior	
None	

Explain how you know



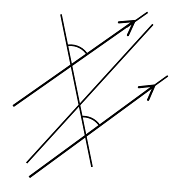
Corresponding	
Alternate	
Co-Interior	
None	

Explain how you know



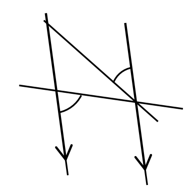
Corresponding	
Alternate	
Co-Interior	
None	

Explain how you know



Corresponding	
Alternate	
Co-Interior	
None	

Explain how you know

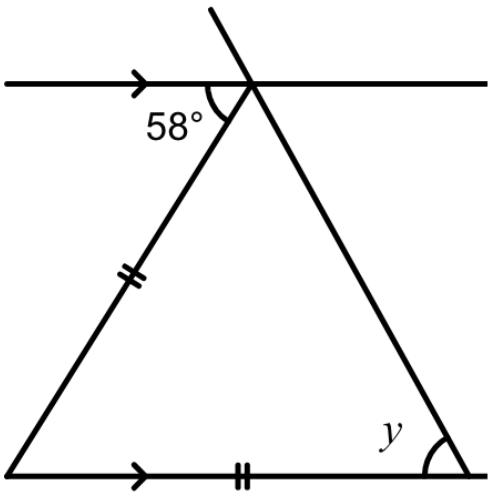


Corresponding	
Alternate	
Co-Interior	
None	

Explain how you know

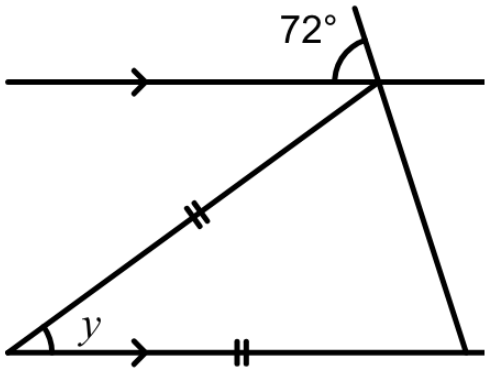
Worked Example

Work out the angle marked y in the diagram below.



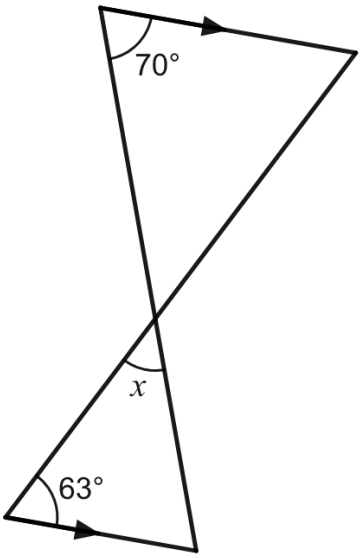
Your Turn

Work out the angle marked y in the diagram below.



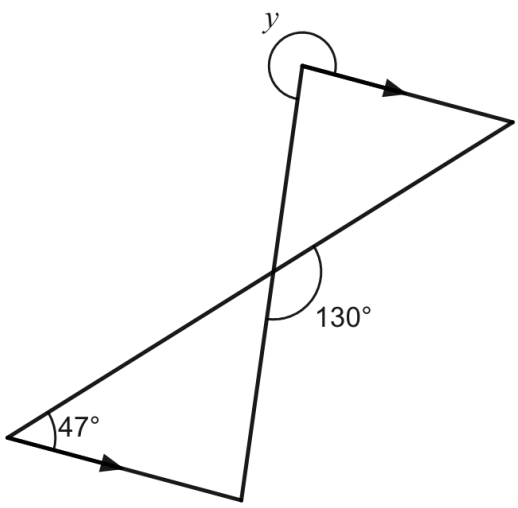
Worked Example

Work out the size of angle x



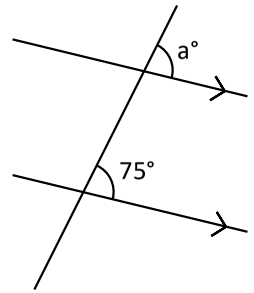
Your Turn

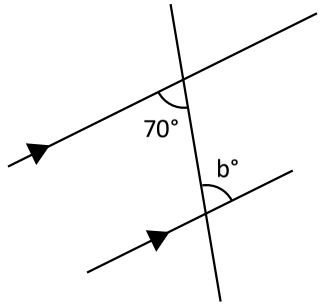
Work out the size of angle y

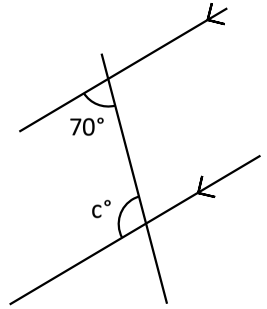


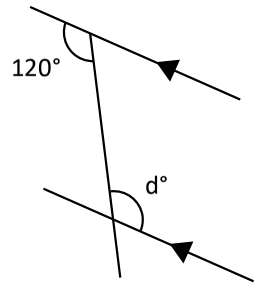
Finding Angles around Parallel Lines

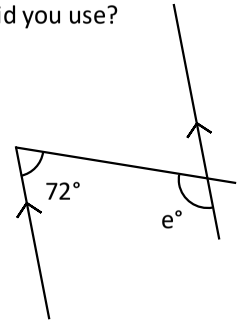
You must be able to explain to someone **why**… What angle rules did you use?

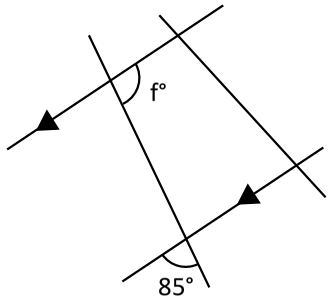


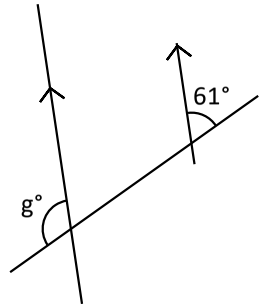


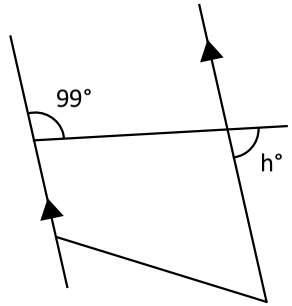


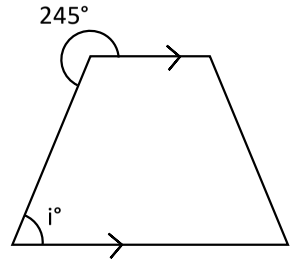


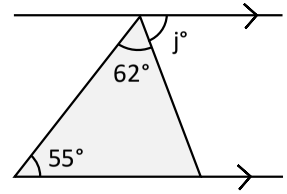


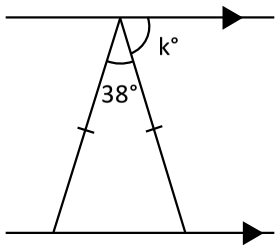


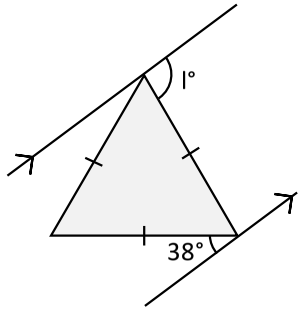


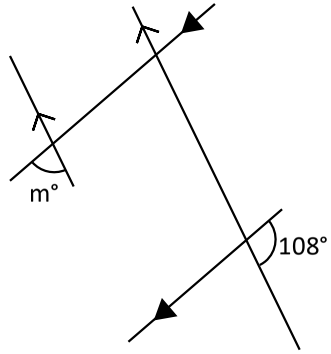


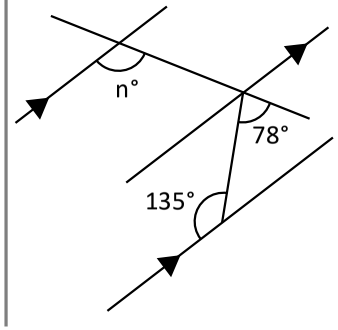


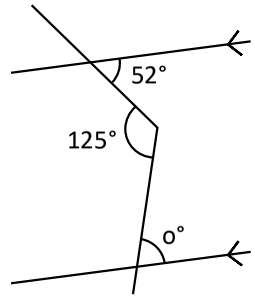








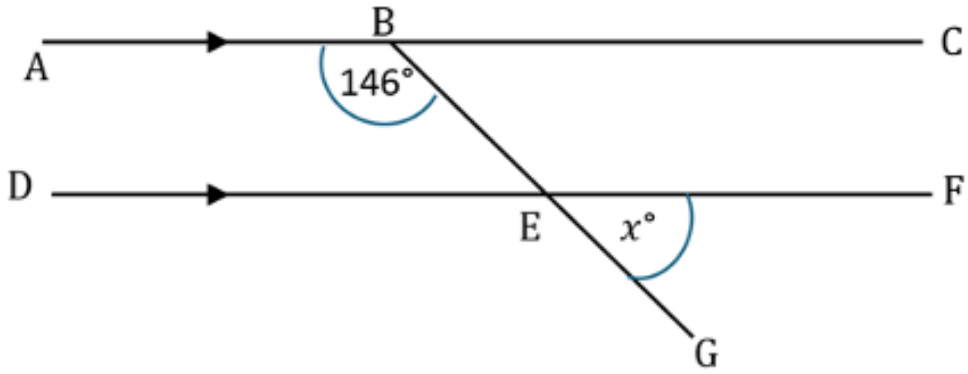




13 Answers	70	65	119	98	120	63	95
		110	71	108	81	75	72

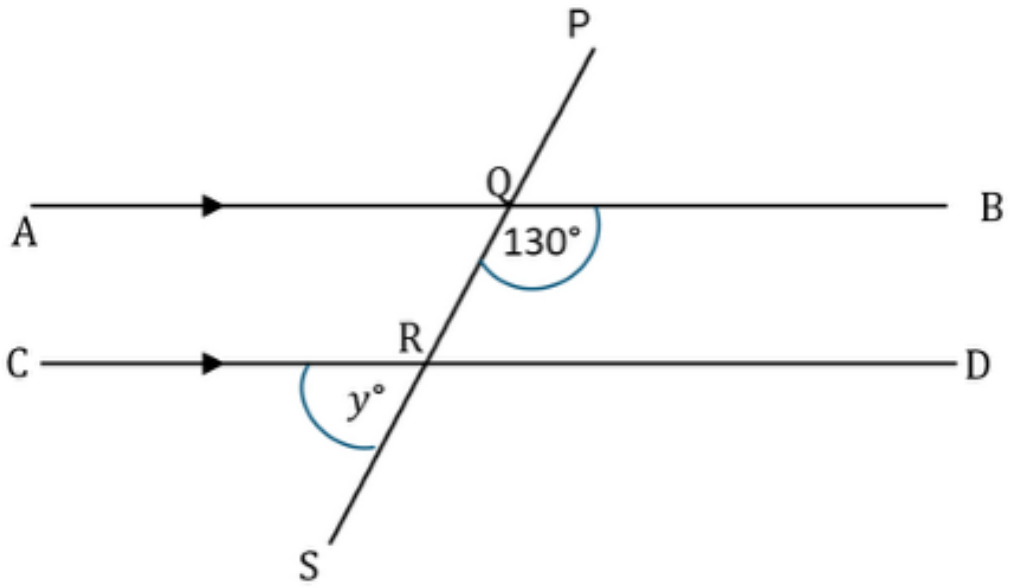
Worked Example

Find the angle marked x
Give reasons for your answer.



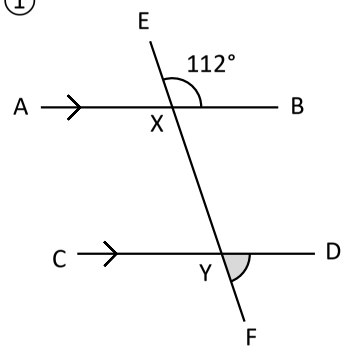
Your Turn

Find the angle marked y
Give reasons for your answer.



Angle Reasoning

①



Angle BXF =

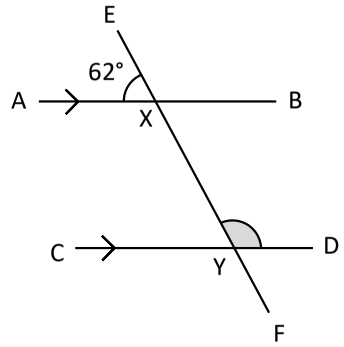
because…

Angle **DYF** =

because…

②

Here are two methods to find angle EYD:



Angle BXF =

because…

Angle **EYD** =

because…

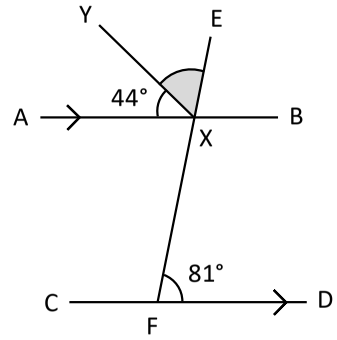
Angle AXF =

because…

Angle **EYD** =

because…

③



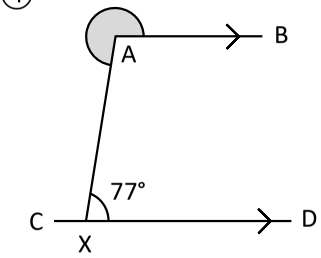
Angle EXB =

because…

Angle **EXY** =

because…

④



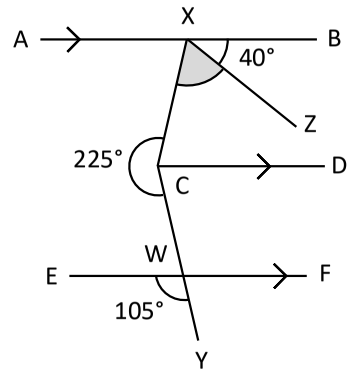
Obtuse Angle BAX =

because…

Reflex Angle **BAX** =

because…

⑤



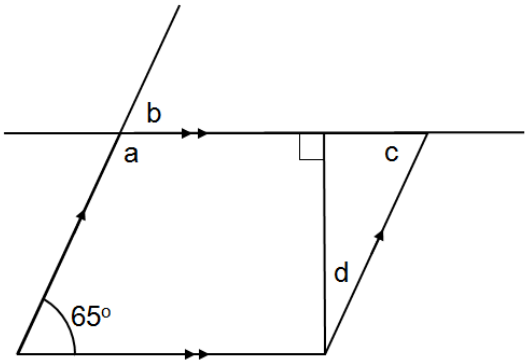
Angle **CXZ** =

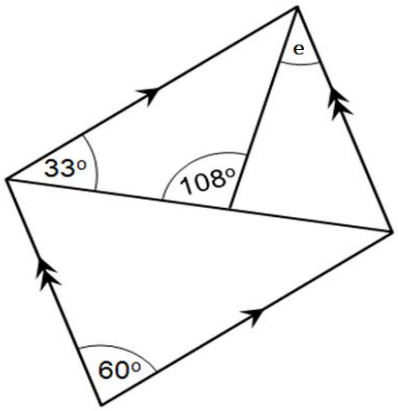
because…

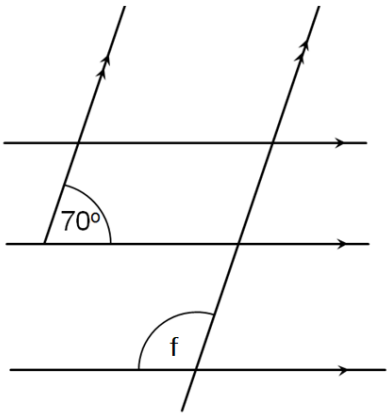
Fluency Practice

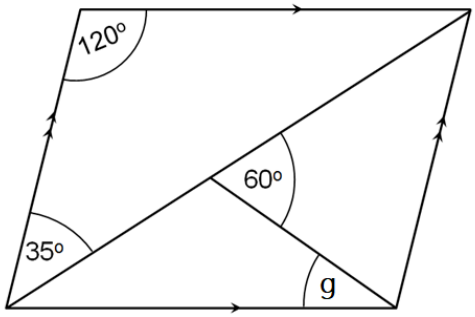
Write your answers in the grid and tick **all** the angle facts you used in each case.

Compare your grid to your partner's grid - did you use the same methods? If not, explain your methods and see if they can follow your thinking.







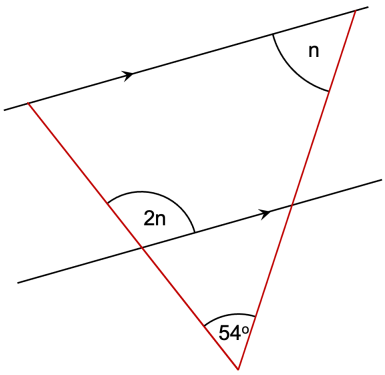


		Angle facts used							
Angle	Size	Alternate angles are equal	Corresponding angles are equal	Co-interior angles are supplementary	Vertically opposite angles are equal	Angles in a triangle sum to 180°	Adjacent angles on a straight line sum to 180°	Angles at a point sum to 360°	Opposite angles in a parallelogram are equal
a									
b									
c									
d									
e									
f									
g									

3.6 Angles in Parallel Lines with Equations

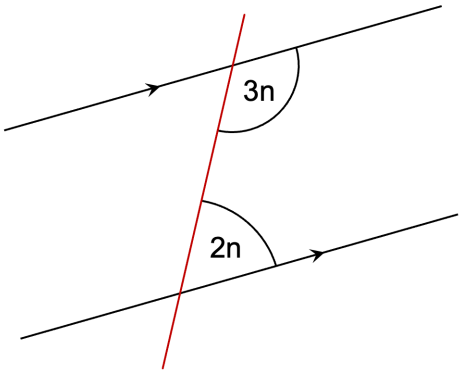
Worked Example

State what the angle n is, giving reasons for your answer.



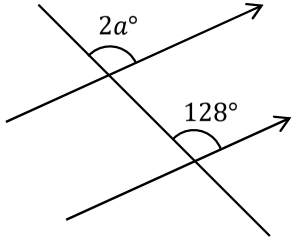
Your Turn

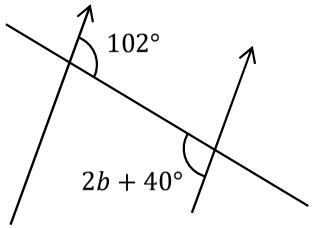
State what the angle n is, giving reasons for your answer.

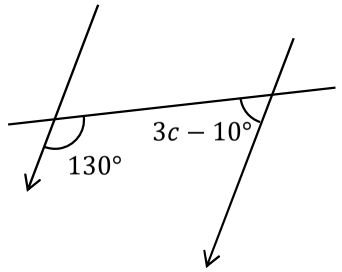


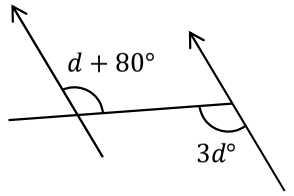
Equations & Parallel Lines

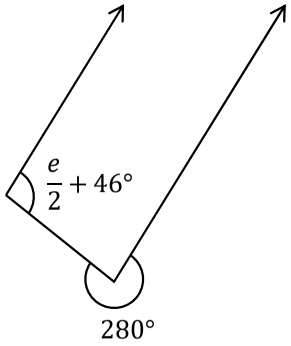
Use angle facts for parallel lines to find the value of the variables a to p.
For each question, state **all** the angle rules you have used.

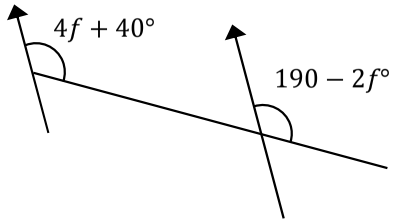


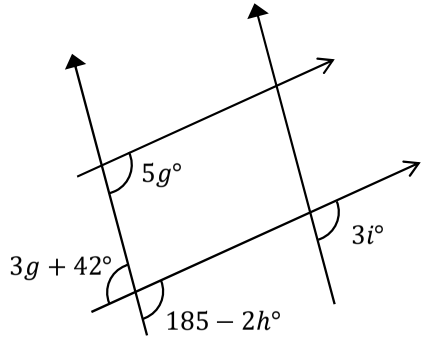


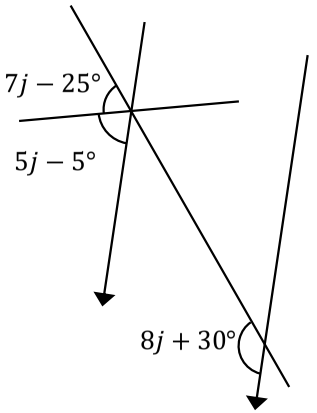


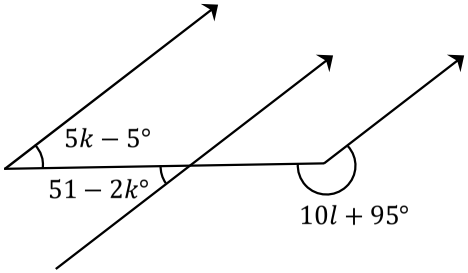


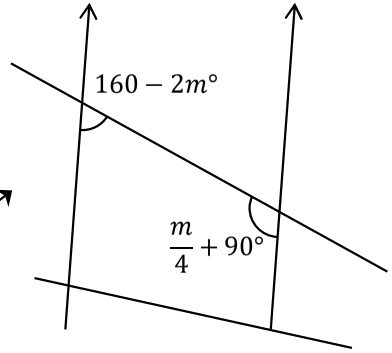


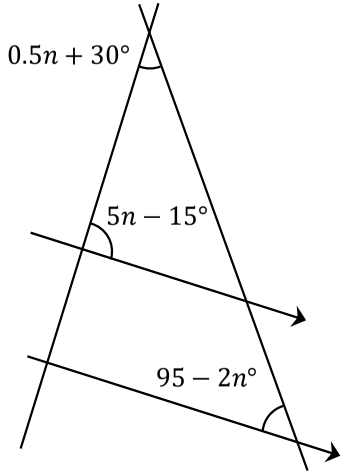


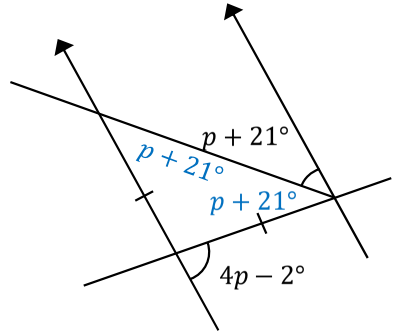






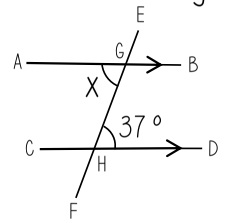


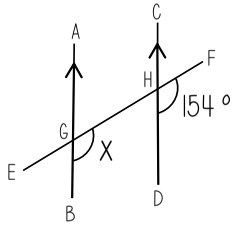


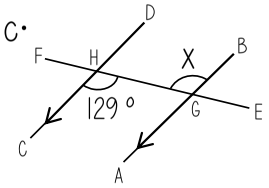


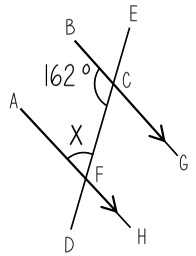
The diagrams are not drawn accurately

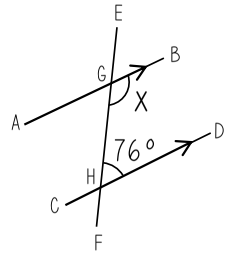
1. Find the missing angle and state what rule you used.

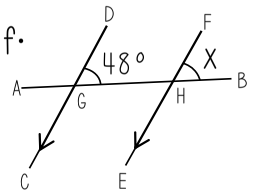
a. 

b. 

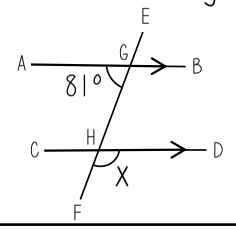
c. 

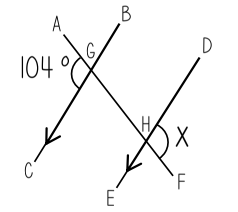
d. 

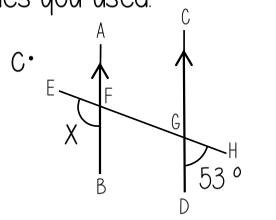
e. 

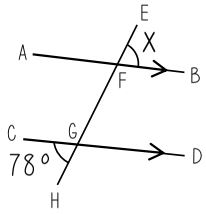
f. 

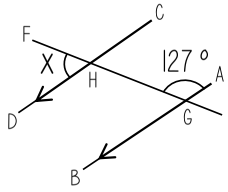
2. Find the missing angle and state what rules you used.

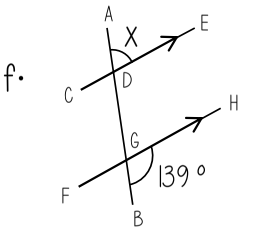
a. 

b. 

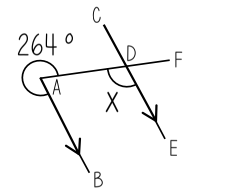
c. 

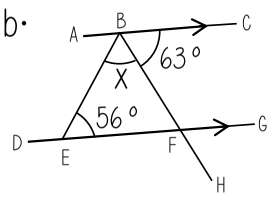
d. 

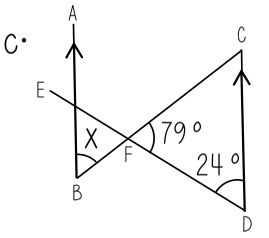
e. 

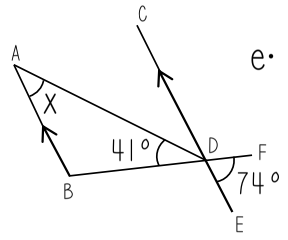
f. 

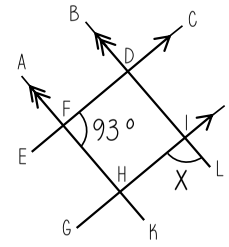
3. Find the missing angle and state what rules you used.

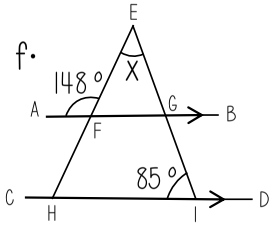
a. 

b. 

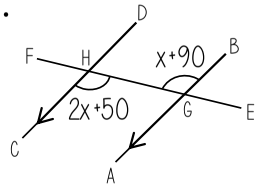
c. 

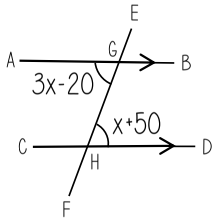
d. 

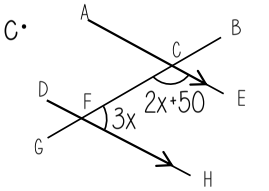
e. 

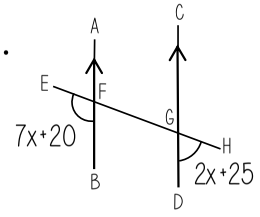
f. 

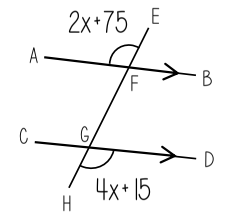
4. Find the value of x.

a. 

b. 

c. 

d. 

e. 

f.