KING EDWARD VI
HANDSWORTH GRAMMAR
SCHOOL FOR BOYS

KING EDWARD VI
ACADEMY TRUST
BIRMINGHAM

Year 7
2025 Mathematics 2026
Unit 5 Booklet

HGS Maths

Tasks

Dr Frost Course

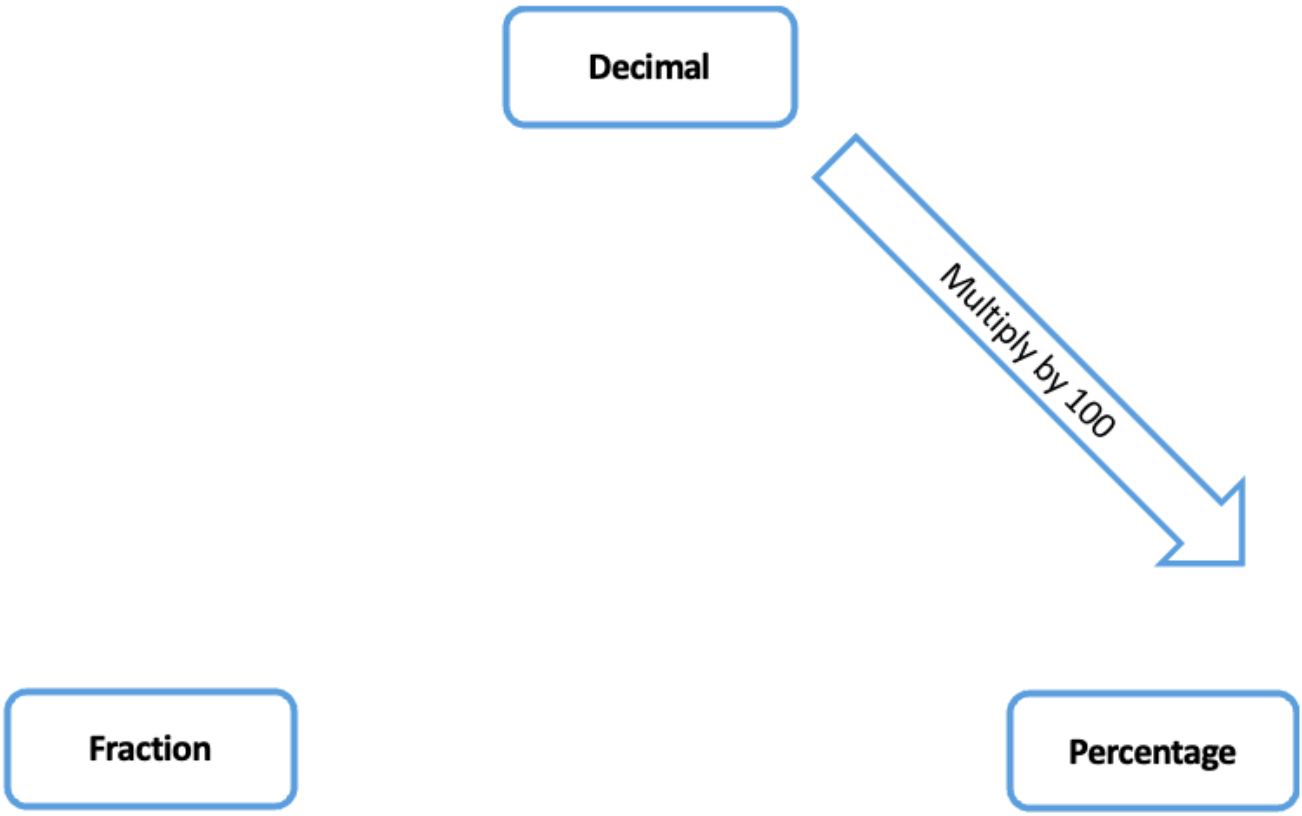
Name: _____

Class: _____

Contents

1 Fractions, Decimals and Percentages

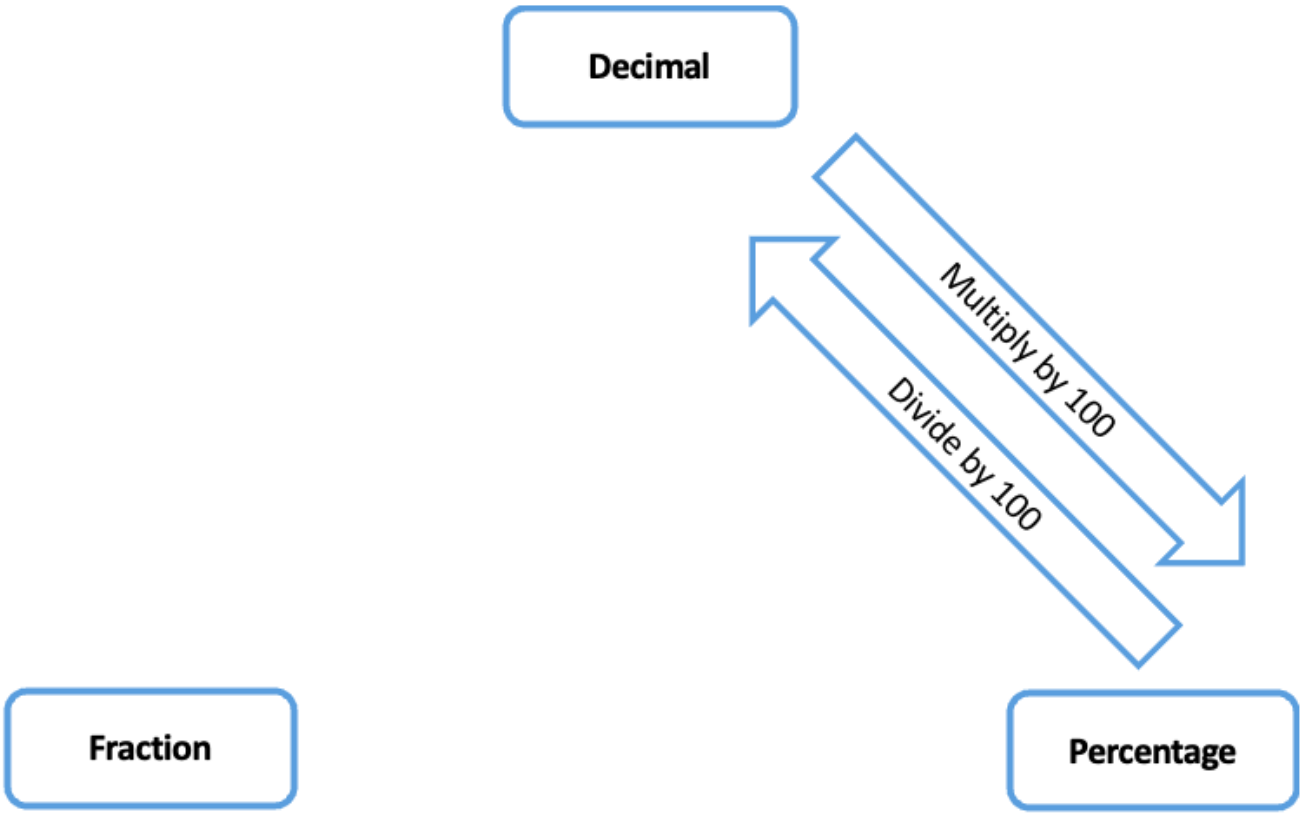
1.1 Decimals to Percentages



Worked Example	Your Turn
Convert the following decimals into percentages: a) 0.7 b) 0.37 c) 0.037 d) 3.7	Convert the following decimals into percentages: a) 0.8 b) 0.38 c) 0.038 d) 3.8

Dr Frost 106b, 106c, 172l and 174a

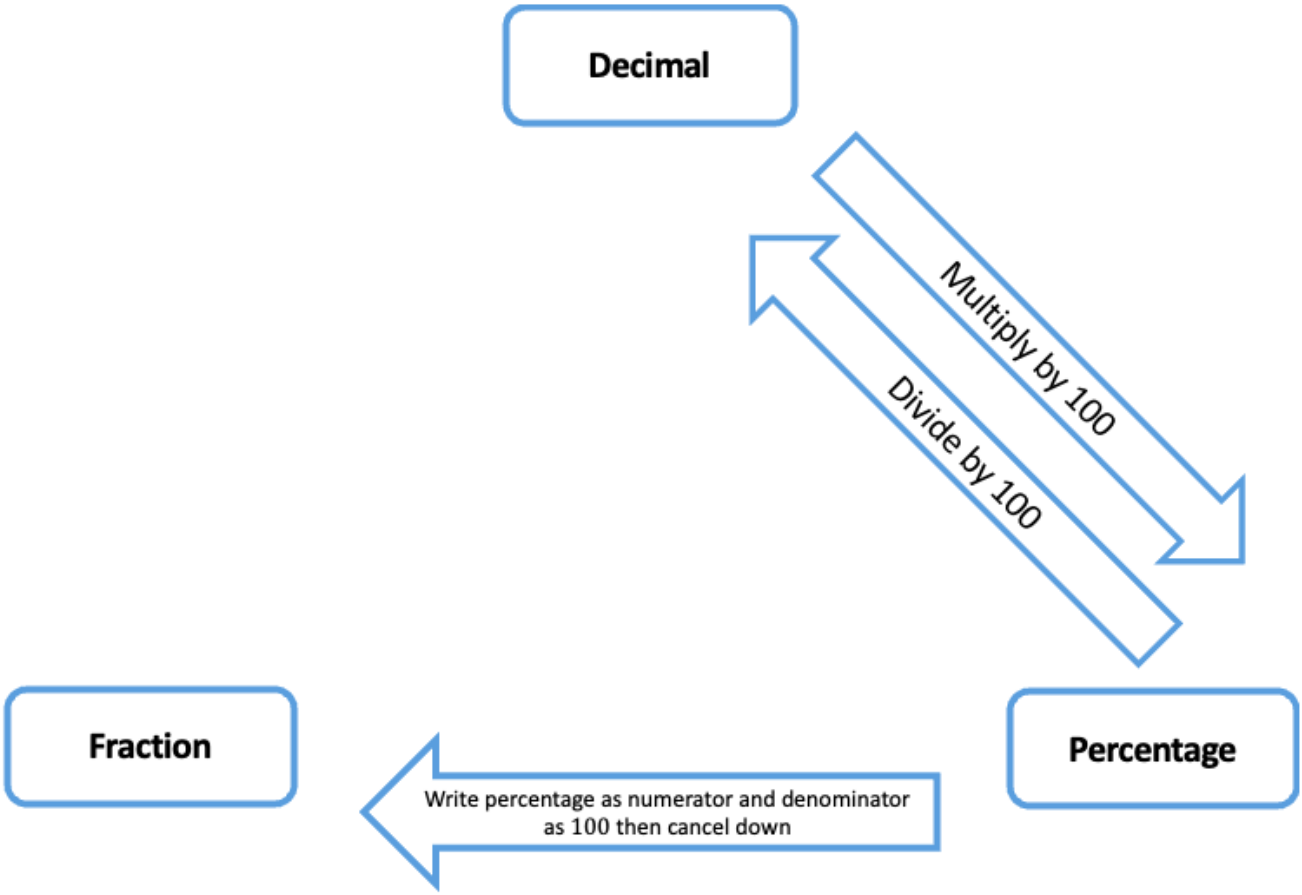
1.2 Percentages to Decimals



Worked Example	Your Turn
Convert the following percentages into decimals: a) 82% b) 8.2% c) 820%	Convert the following percentages into decimals: a) 81% b) 8.1% c) 810%

Dr Frost 106a, 172m and 174b

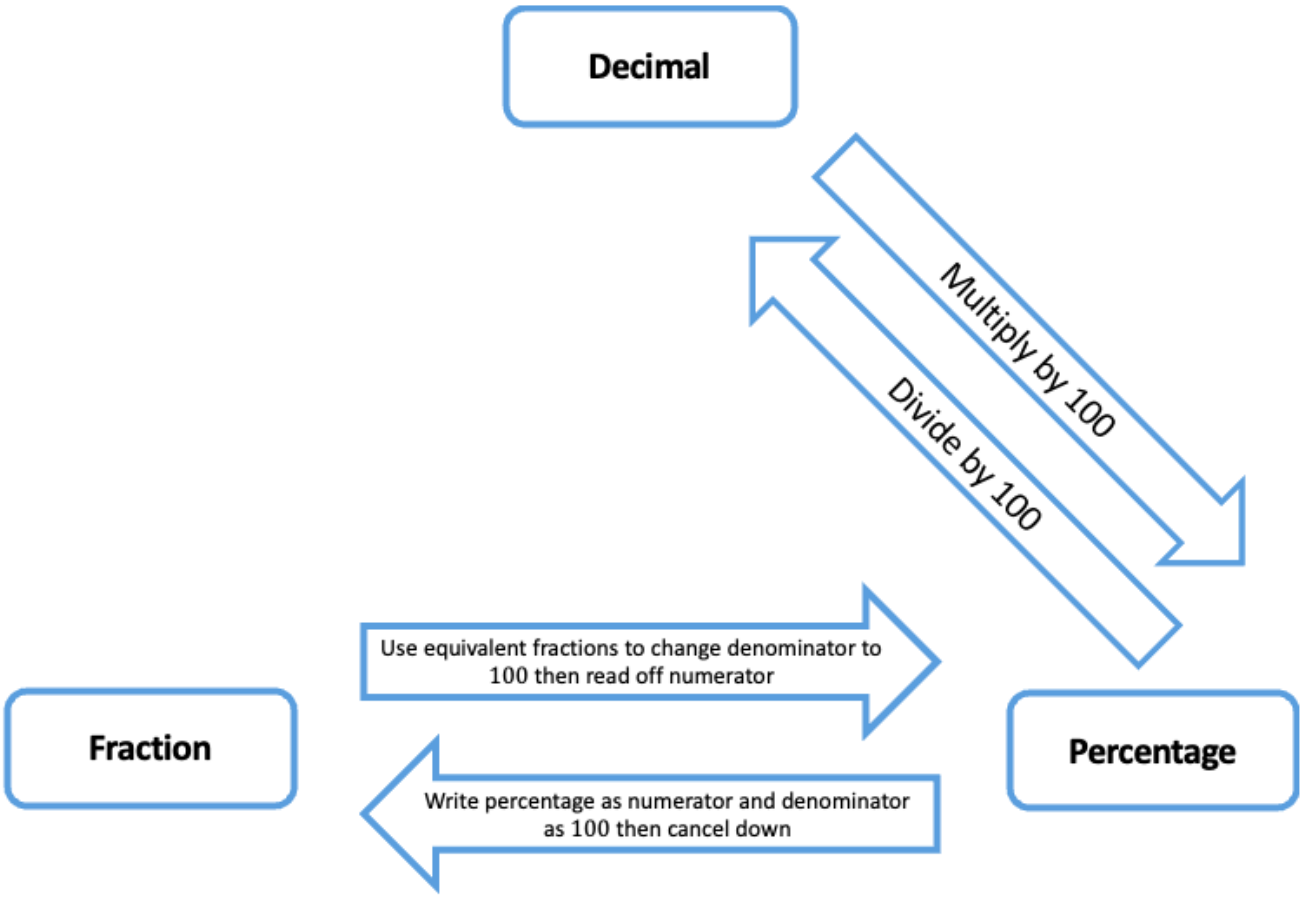
1.3 Percentages to Fractions



Worked Example	Your Turn
Convert the following percentages into fractions in their simplest form: a) 6% b) 66% c) 66.6% d) 666%	Convert the following percentages into fractions in their simplest form: a) 8% b) 88% c) 88.8% d) 888%

Dr Frost 105b, 172f and 174c

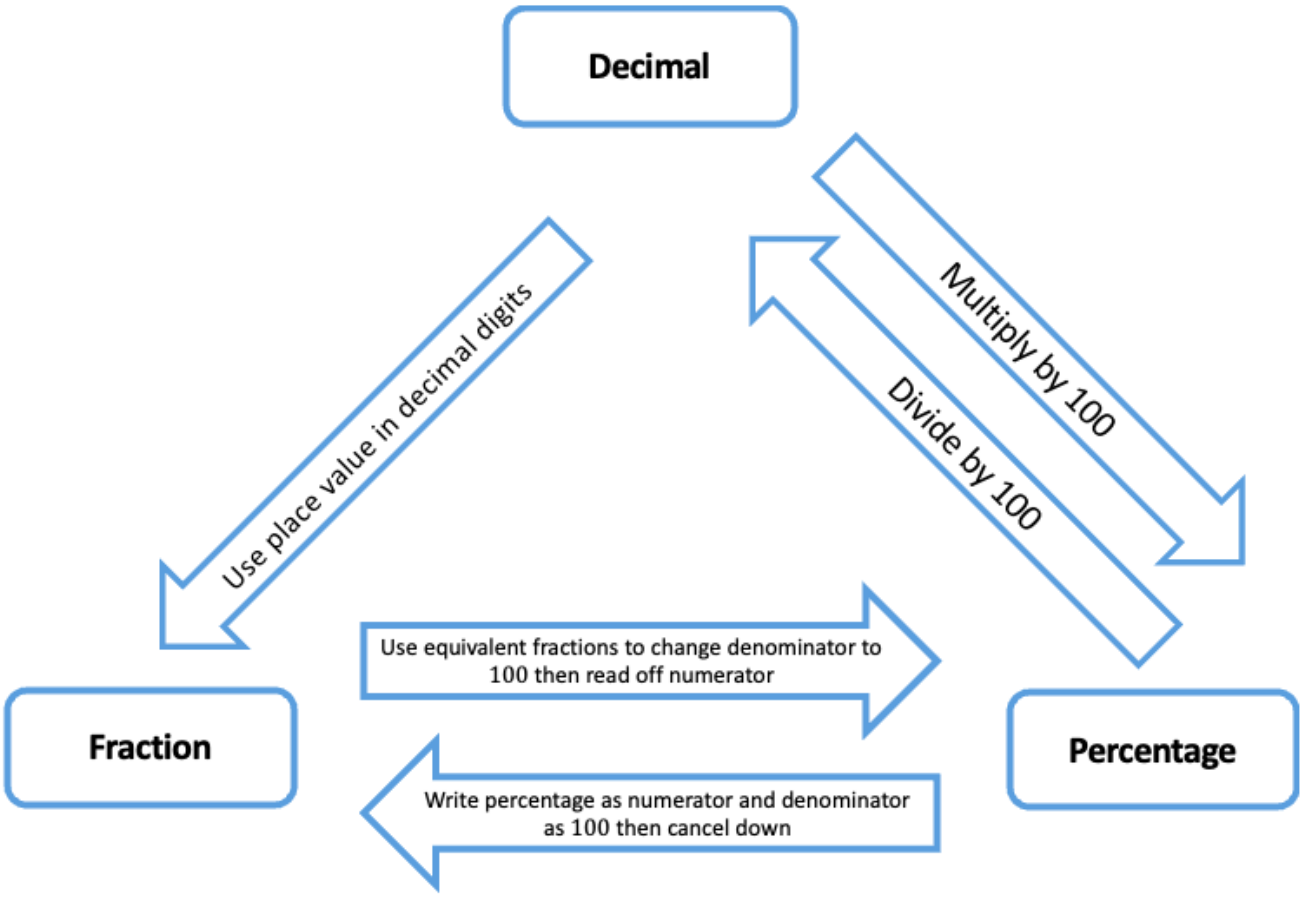
1.4 Fractions to Percentages



Worked Example	Your Turn
Convert the following fractions into percentages: a) $\frac{6}{10}$ b) $\frac{6}{5}$ c) $\frac{6}{60}$ d) $\frac{6}{600}$	Convert the following fractions into percentages: a) $\frac{8}{10}$ b) $\frac{8}{5}$ c) $\frac{8}{40}$ d) $\frac{8}{400}$

Dr Frost 172g, 172h and 172i

1.5 Decimals to Fractions



Worked Example	Your Turn
Convert the following decimals into fractions in their simplest form: a) 0.8 b) 0.08 c) 0.085 d) 8.5	Convert the following decimals into fractions in their simplest form: a) 0.2 b) 0.02 c) 0.025 d) 2.5

Dr Frost 172d and 174f

1.6 Recurring Decimal Notation

- $0.123\dot{4}$

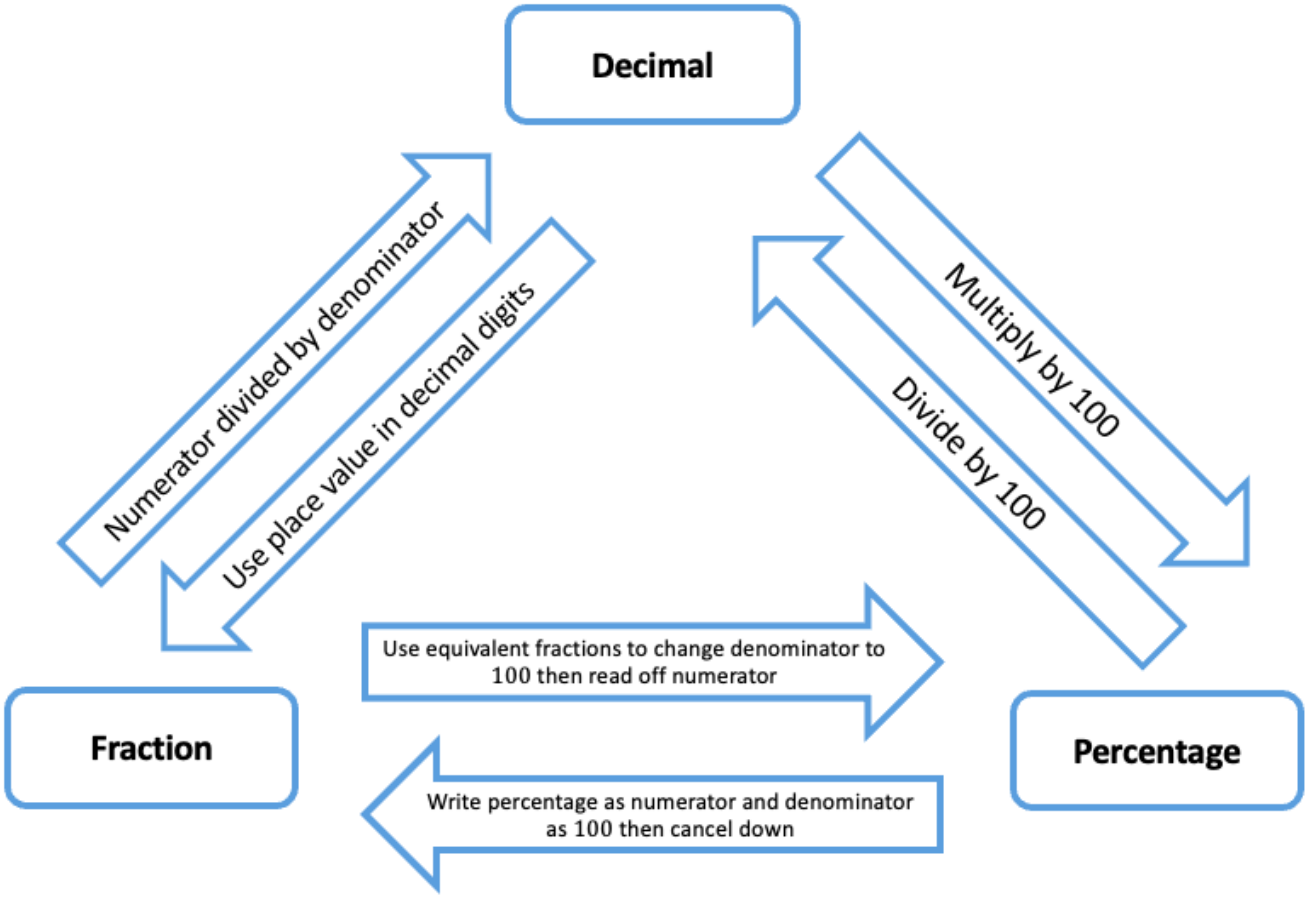
- $0.\dot{6}$

- $2.\dot{3}\dot{7}$

- $0.\dot{1}42857\dot{}$

- $7846.1\dot{3}$

1.7 Fractions to Decimals



Worked Example	Your Turn
Convert the following fractions into decimals: a) $\frac{1}{8}$ b) $\frac{2}{3}$ c) $\frac{2}{15}$	Convert the following fractions into decimals: a) $\frac{3}{8}$ b) $\frac{2}{9}$ c) $\frac{5}{12}$

Dr Frost 172a, 172b, 172c, 172e and 173a

Worked Example	Your Turn
a) Write $\frac{7}{40}$ as a percentage.	a) Write $\frac{3}{16}$ as a percentage.
b) Write $\frac{105}{16}$ as a decimal.	b) Write $\frac{79}{8}$ as a decimal.
c) Convert $\frac{17}{8}$ to a percentage.	c) Convert $\frac{27}{16}$ to a percentage.

Dr Frost 172k, 174d and 174e

2 Ordering Numbers

2.1 Ordering Negative Numbers

Worked Example	Your Turn
Write in ascending order: $-2, -1, 4, 3$	Write in ascending order: $-7, -8, 8, 7$

Dr Frost 86c and 86d

2.2 Ordering Decimals

Worked Example	Your Turn
Write in ascending order: $0.5037, 0.5, 0.53, 0.503, 0.5007$	Write in ascending order: $0.2089, 0.2, 0.28, 0.208, 0.2009$

Dr Frost 71b, 71d, 71f, 71h and 86f

2.3 Ordering Fractions

Worked Example	Your Turn
Arrange the following fractions in ascending order: a) $\frac{3}{10}, \frac{5}{10}, \frac{1}{10}, \frac{4}{10}$ b) $\frac{1}{2}, \frac{3}{5}, \frac{3}{4}, \frac{7}{10}$	Arrange the following fractions in ascending order: a) $\frac{5}{8}, \frac{7}{8}, \frac{3}{8}, \frac{6}{8}$ b) $\frac{1}{2}, \frac{5}{6}, \frac{3}{4}, \frac{7}{8}$

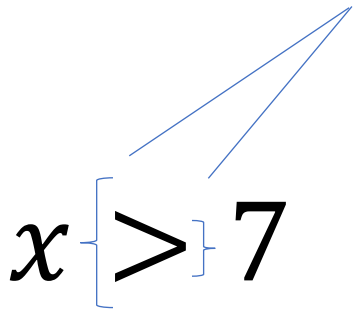
Dr Frost 55c, 55i, 99b, 116b and 116d

2.4 Ordering FDP

Worked Example	Your Turn
Write in ascending order: $\frac{17}{25}, 0.18, 90\%, 81\%, 0.39$	Write in ascending order: $27\%, \frac{79}{100}, \frac{9}{50}, 0.91, 0.46$

2.5 Inequalities

Notice the symbol is taller on the side which is larger.



Inequality	What It Means
$x > 7$	"x is greater than 7" This doesn't include 7 Examples: $7.2, 10$
$x \geq 7$	"x is greater than or equal to 7" or "x is at least 7" This does include 7 Examples: $7, 8, 100.5$
$x < 10$	"x is less than 10" Examples: $-3, 4, 9.2$
$x \leq 8$	"x is less than or equal to 8" or "x is at most 8" Examples: $8, -3, 4, 7.2$

Worked Example	Your Turn
Write an inequality in between the two numbers: a) -4 -5 b) 4.1 4.11 c) $\frac{3}{8}$ $\frac{2}{7}$	Write an inequality in between the two numbers: a) -3 -2 b) 3.12 3.2 c) $\frac{3}{5}$ $\frac{5}{8}$

Dr Frost 86a, 86b, 71a, 71c, 71e, 71g, 86e, 99a, 116a and 116c

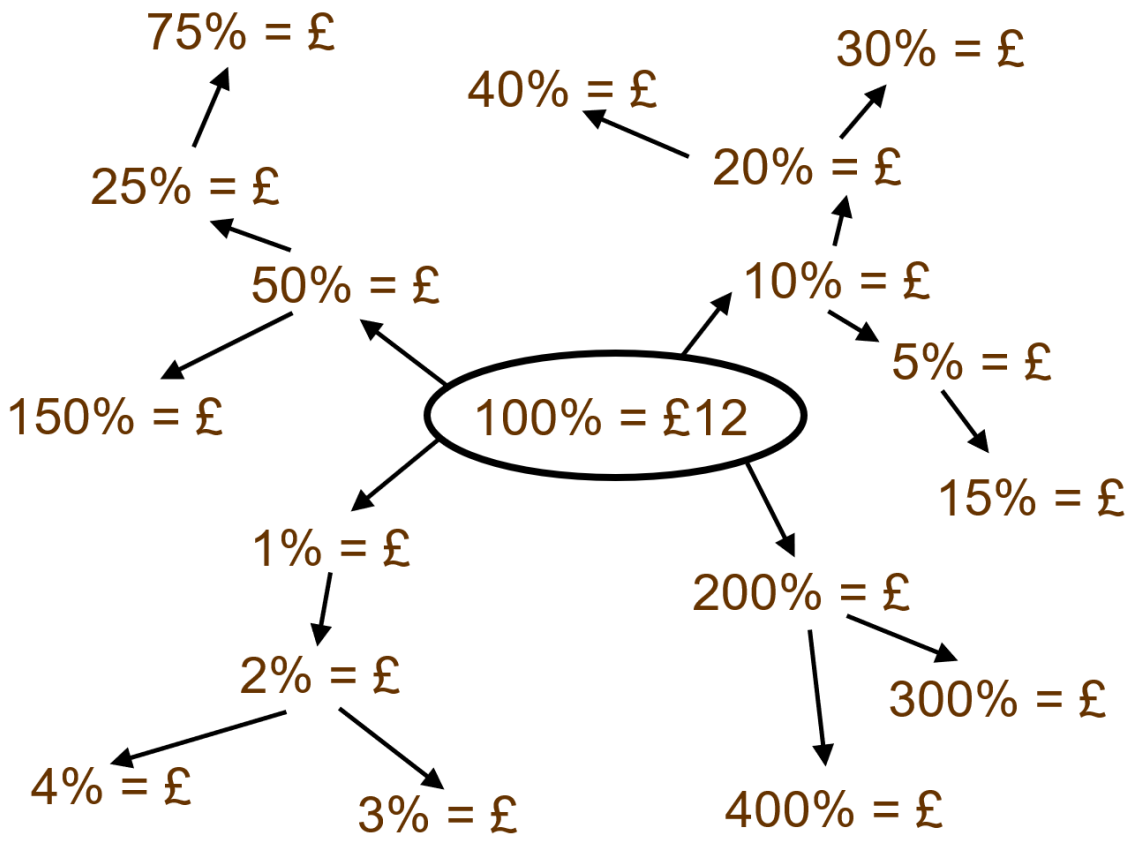
Worked Example	Your Turn
Determine whether the following statement is true or false. a) $1.84 < 197\%$ b) $0.79 < \frac{43}{50}$ c) $122\% < \frac{6}{5}$	Determine whether the following statement is true or false. a) $1.6 > 159\%$ b) $\frac{13}{20} > 0.48$ c) $172\% > 1\frac{22}{25}$

Dr Frost 175a, 175b and 175c

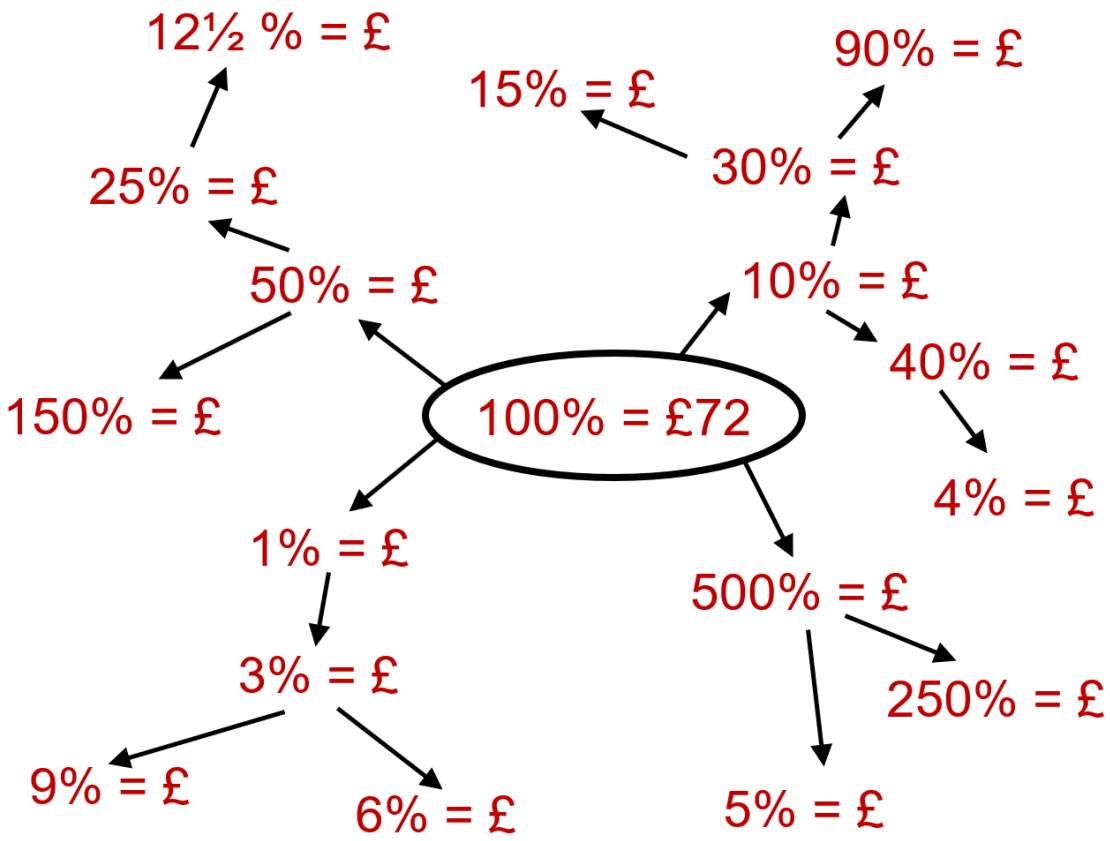
3 Percentages

3.1 Percentages of Amounts

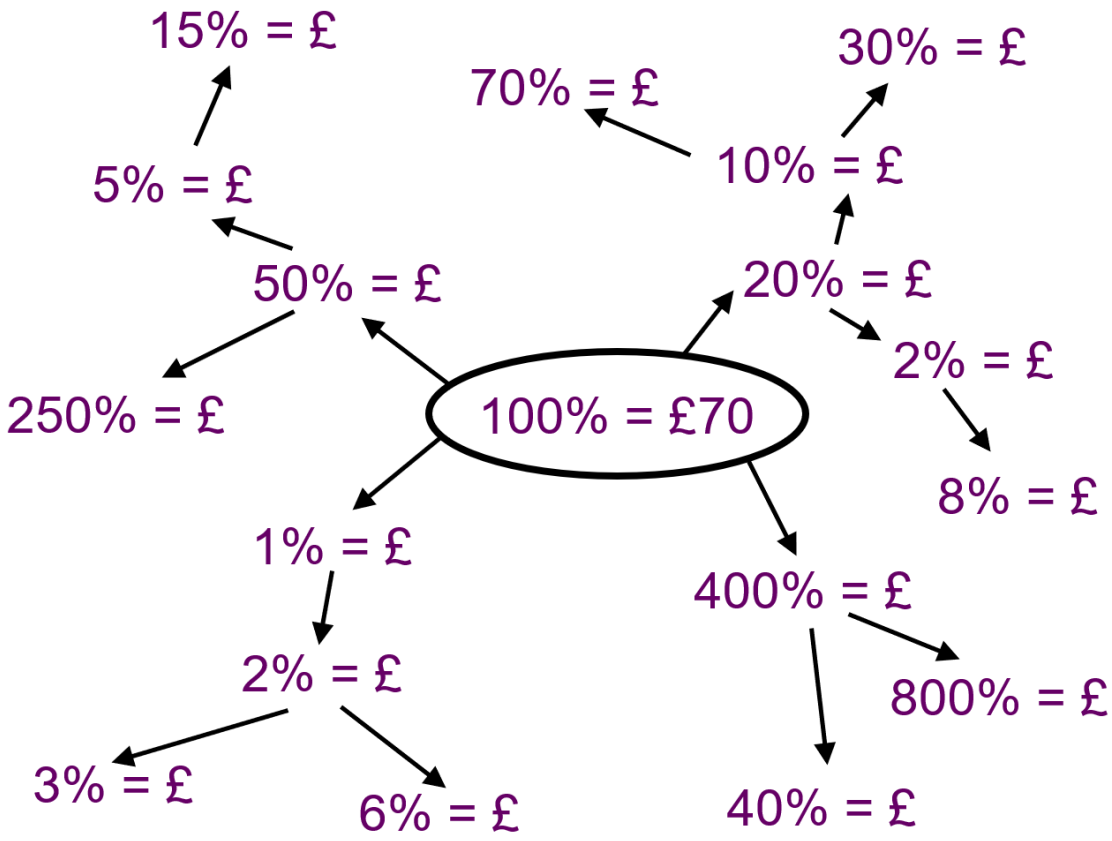
Worked Example



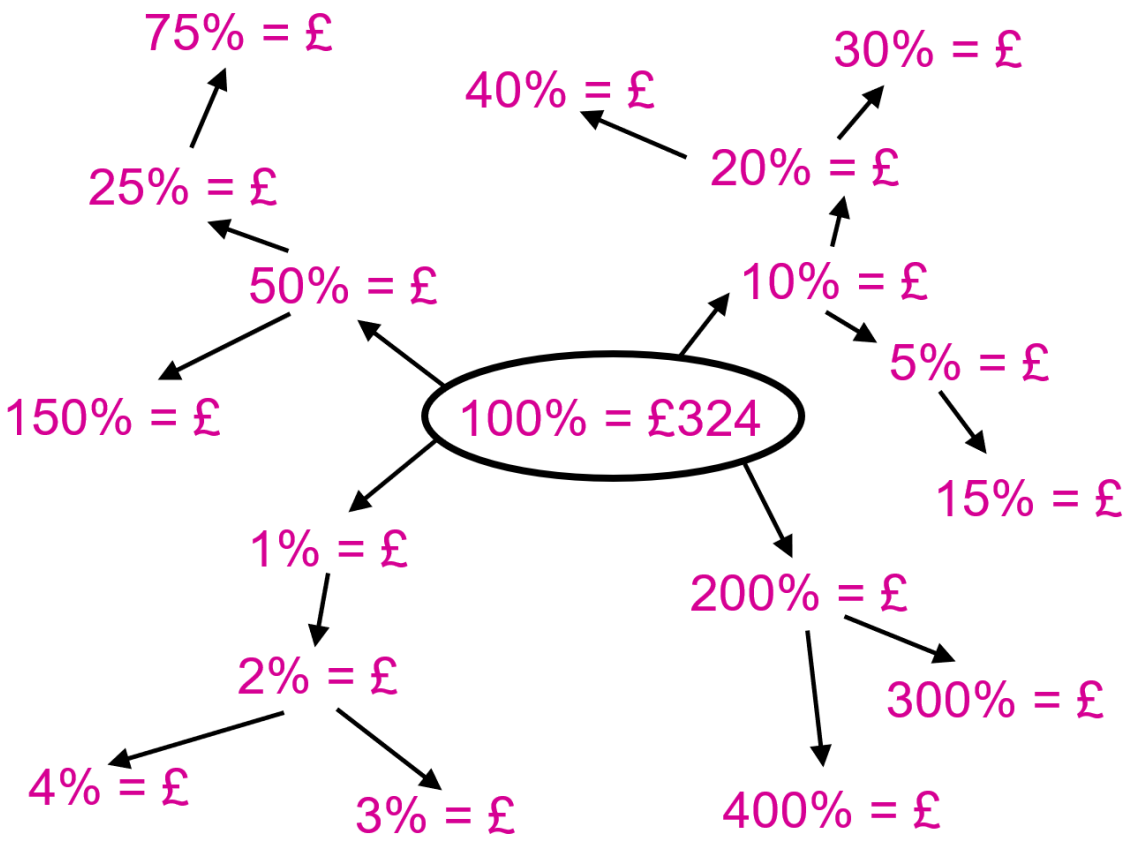
Your Turn



Your Turn



Your Turn



3.2 Percentage Increase

Worked Example	Your Turn
Increase 40 by 20%	Increase 90 by 20%

3.3 Percentage Decrease

Worked Example	Your Turn
Decrease 40 by 20%	Decrease 90 by 20%

3.4 Percentage Change

Worked Example	Your Turn
Calculate the percentage change: a) Original value: £400 New value: £360 b) Original value: £400 New value: £440	Calculate the percentage change: a) Original value: £200 New value: £150 b) Original value: £200 New value: £250

Dr Frost 215a, 215d and 216a

Worked Example	Your Turn
Djamel buys 160 video games for £12 each. He sells $\frac{3}{8}$ of the games for £16.56 each. He sells 30% of the games for £14.24 each. He sells the rest of the games for £13.52 each. Calculate his percentage profit.	Ruby buys 560 house plants for £15 each. She sells $\frac{5}{7}$ of the plants for £18.30 each. She sells 20% of the plants for £16.10 each. She sells the rest of the plants for £13.68 each. Calculate her percentage profit.

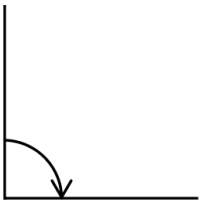
3.5 Reverse Percentages

Worked Example	Your Turn
Given that 110% of a number is 66, work out the original number.	Given that 80% of a number is 240, work out the original number.

Worked Example	Your Turn
Calculate the original amount: a) Percentage change: 10% decrease New value: £360 b) Percentage change: 10% increase New value: £440	Calculate the original amount: a) Percentage change: 25% decrease New value: £150 b) Percentage change: 25% increase New value: £250

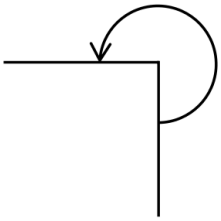
4 Angle Basics

4.1 Types of Turns and Angles

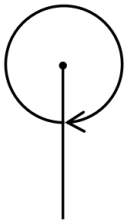


A quarter of a turn clockwise

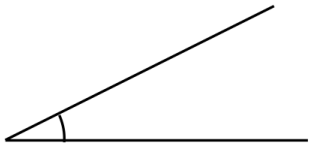
Half a turn anticlockwise



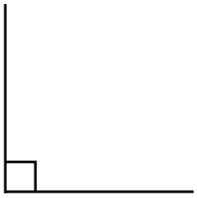
Three quarters of a turn anticlockwise



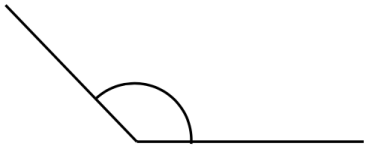
A full turn clockwise



Acute Angle

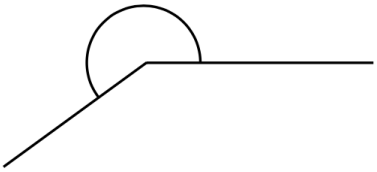


Right Angle

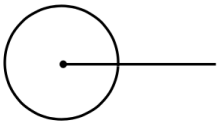


Obtuse Angle

Straight Line



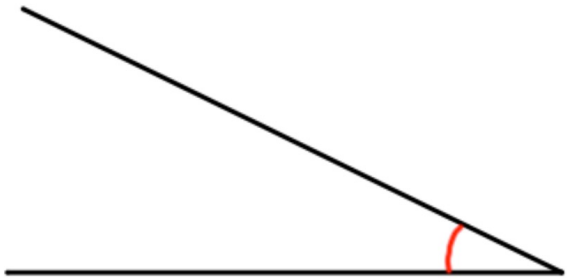
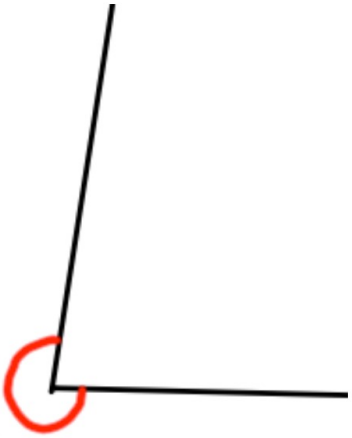
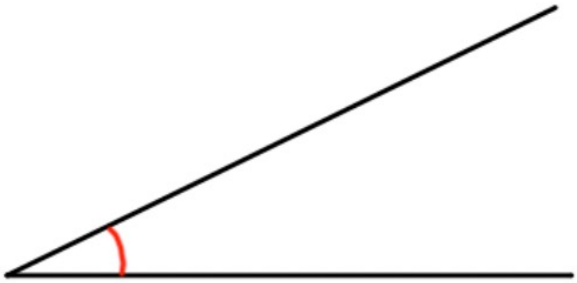
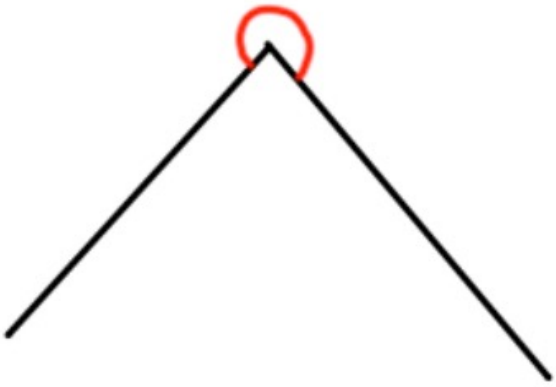
Reflex Angle



Full Turn

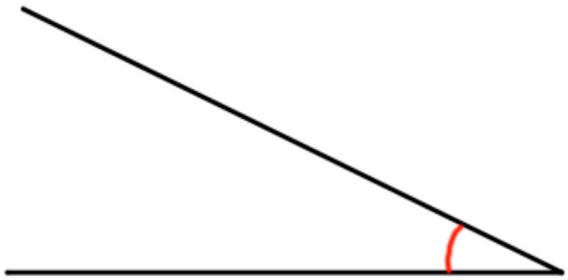
Acute	Right	Obtuse	Straight	Reflex	Full turn
$0° < \theta < 90°$	$90° = \theta$	$90° < \theta < 180°$	$180° = \theta$	$180° < \theta < 360°$	$360° = \theta$

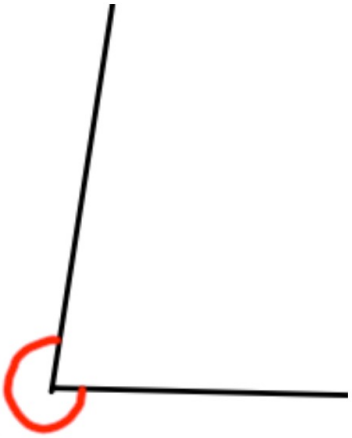
4.2 Estimating Angles

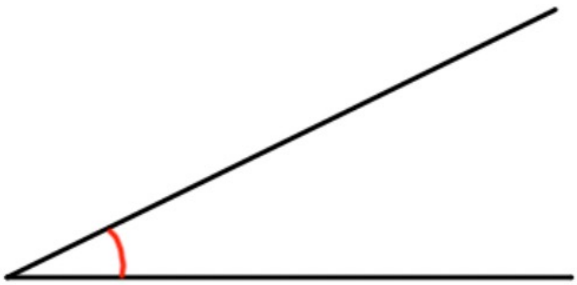
Worked Example	Your Turn
Estimate the angles below.  	Estimate the angles below.  

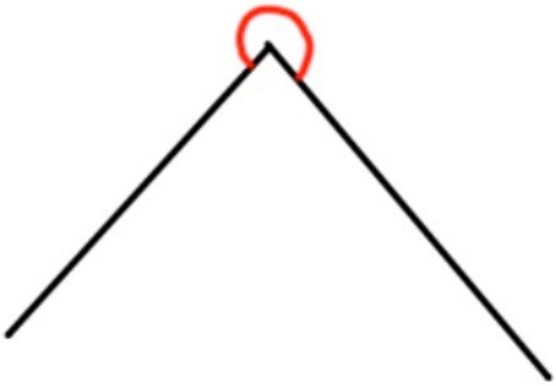
4.3 Measuring Angles

Worked Example	Your Turn
Measure the angles below.	Measure the angles below.







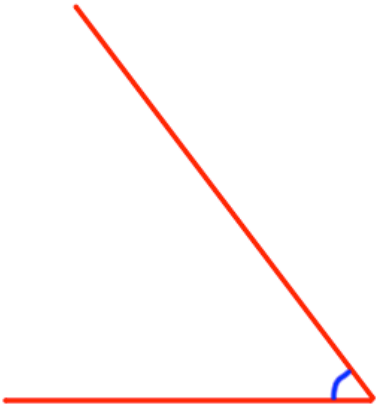


Fluency Practice

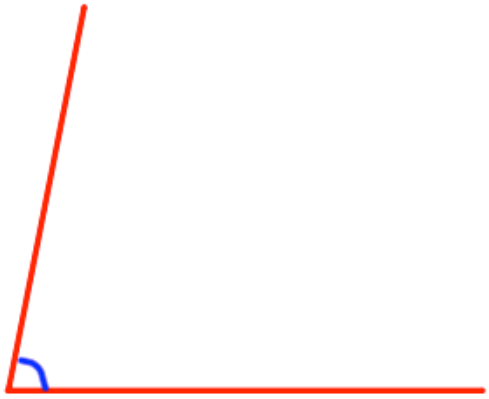
Question 2: Measure each angle below

(a)

(b)



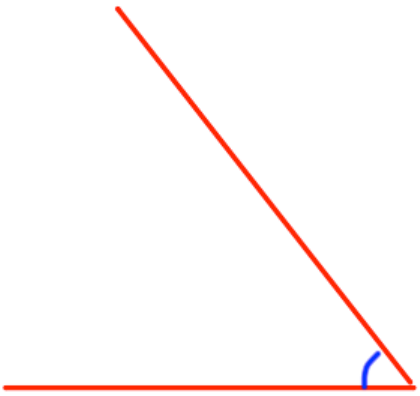
(c)



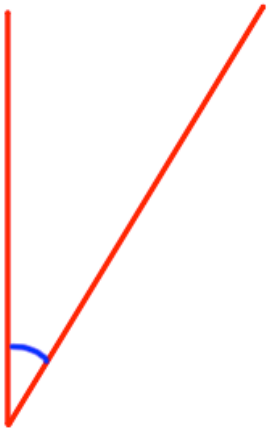
(d)

(e)

(f)



(g)



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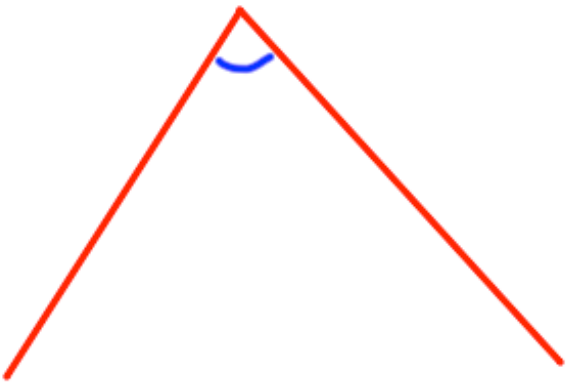
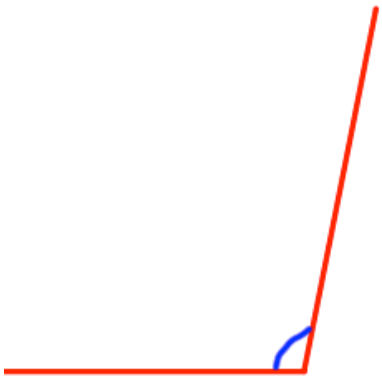


Fluency Practice

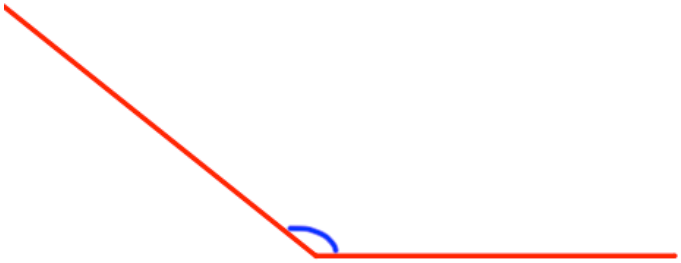
Question 3: Measure each angle below

(a)

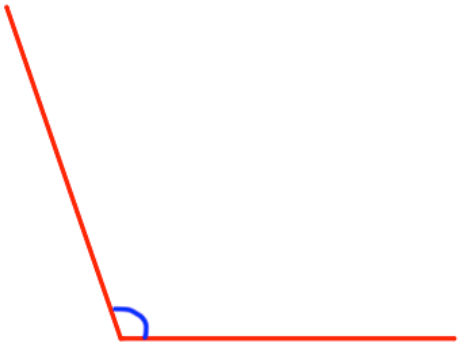


(b)

(c)



(d)



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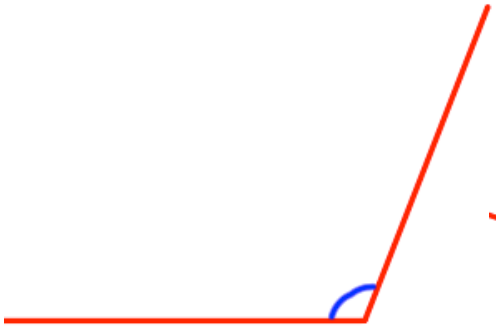

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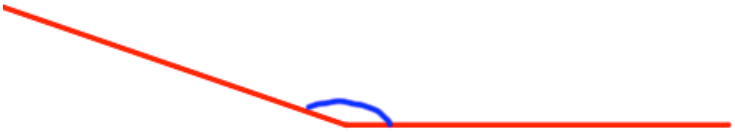

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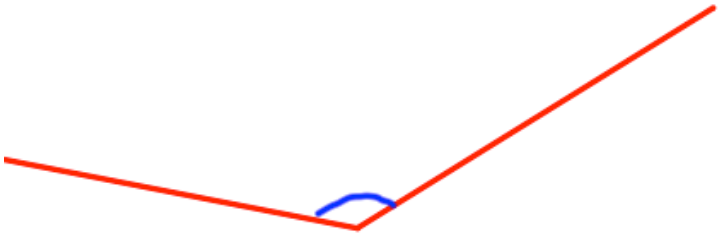
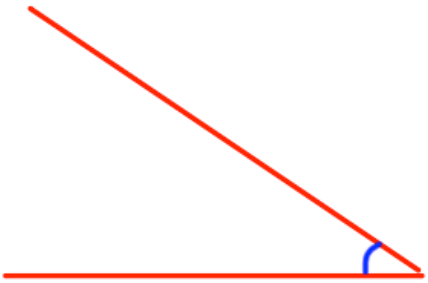
(h)



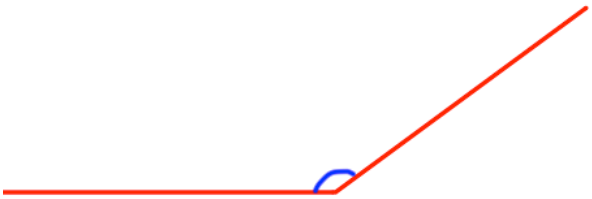
Fluency Practice

Question 4: Measure each angle below

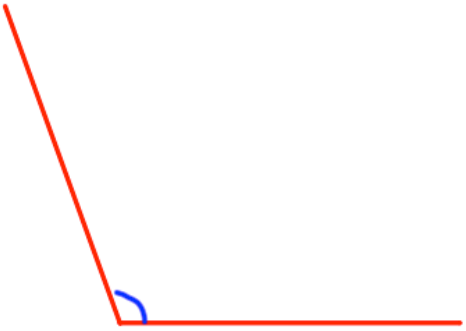
(a)



(b)



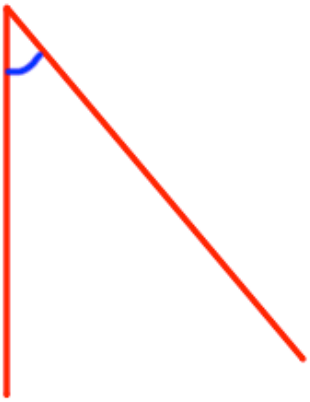
(c)



(d)

(e)

(f)



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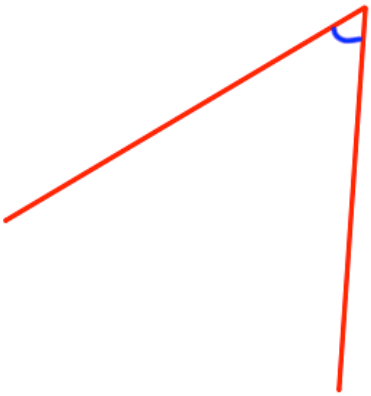


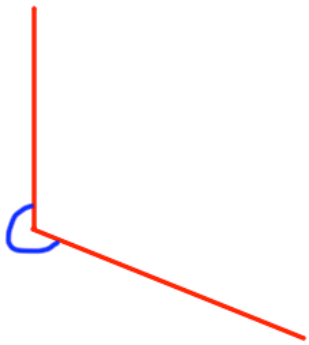
(h)

Fluency Practice

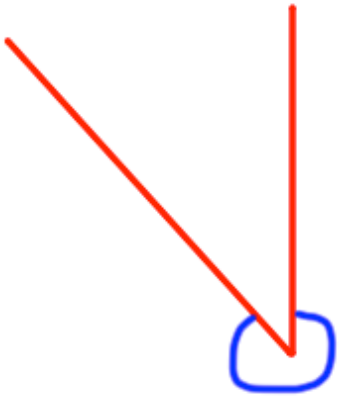
Question 5: Measure each reflex angle below

(a)

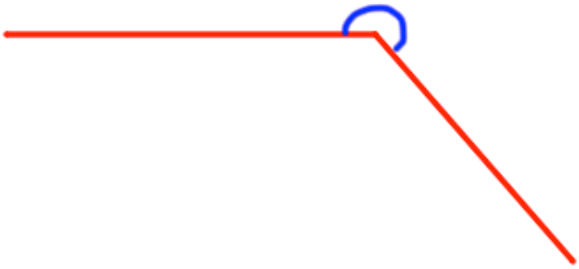
(b)



(c)



(d)

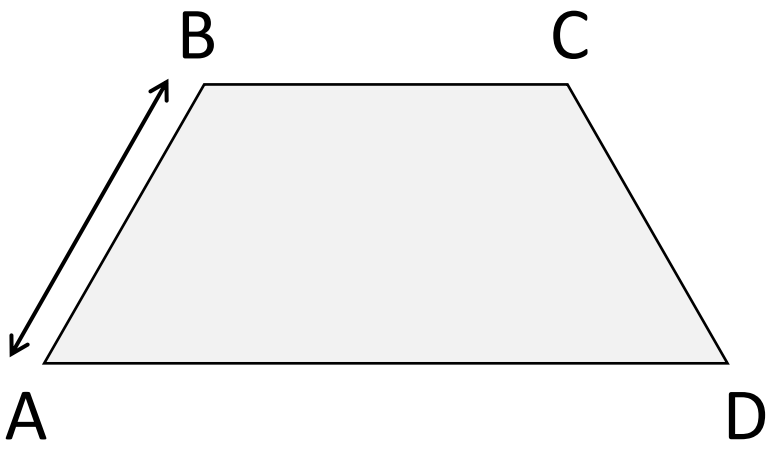


4.4 Drawing Angles

Worked Example	Your Turn
Draw an angle of $70°$	Draw an angle of $80°$
Draw an angle of $215°$	Draw an angle of $225°$

4.5 Notation and Labelling

Labelling Lengths



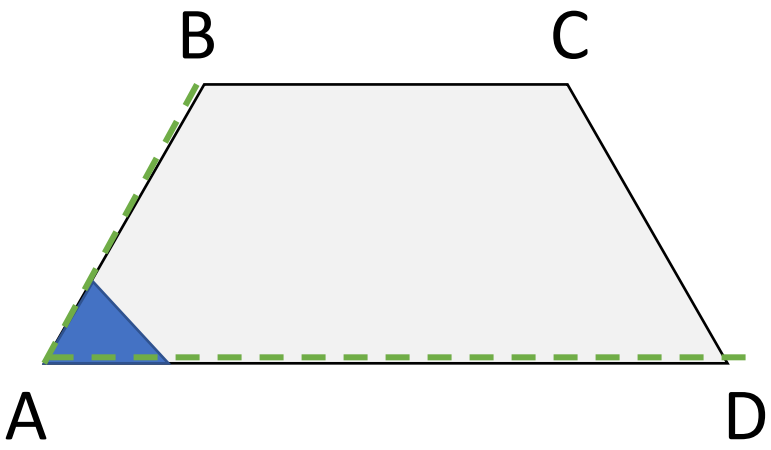
Each point (or corner) of a shape is labelled with a letter.

If we are talking about this distance…

We say we are looking for the length of AB

Because it is the distance between the point labelled A and the point labelled B

Labelling Angles



Each point (or corner) of a shape is labelled with a letter

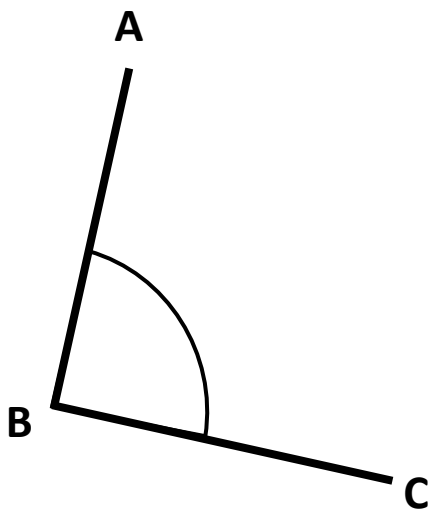
If we are talking about this angle…

We say we are looking for the angle DAB

Because if we draw a line in order from point D to point A to point B, we draw around the angle

Angle Notation

We can label angles in multiple ways:
$\boldsymbol{\angle ABC \; or \; A\hat{B}C \; or \; Angle \; ABC}$



It can help to see these are instructions rather than labels:

“The turn from line AB to line BC”

We don’t need to specify direction yet, so:
$\boldsymbol{A\hat{B}C = C\hat{B}A}$

“The turn from line BC to line AB”

Note: We use capital letter for points.

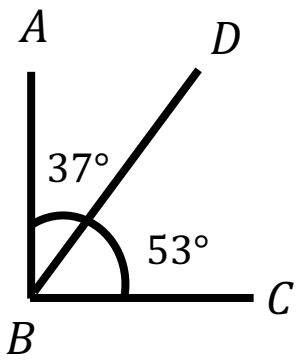
Worked Example

Write down the values of:

$\angle ABD =$

$\angle DBC =$

$\angle ABC =$



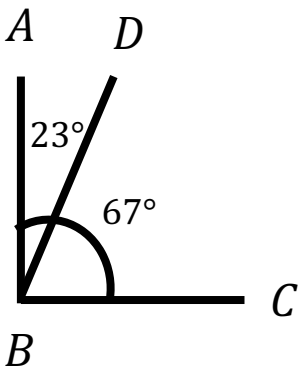
Your Turn

Write down the values of:

$\angle ABD =$

$\angle DBC =$

$\angle ABC =$



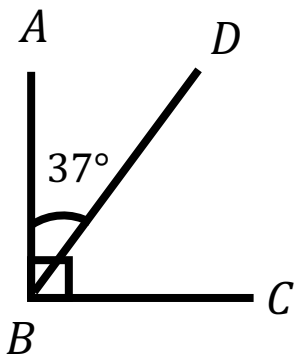
Worked Example

Write down the values of:

$\angle ABD =$

$\angle ABC =$

$\angle DBC =$



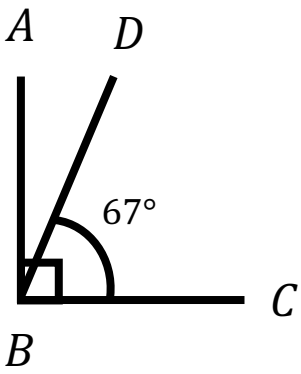
Your Turn

Write down the values of:

$\angle DBC =$

$\angle ABC =$

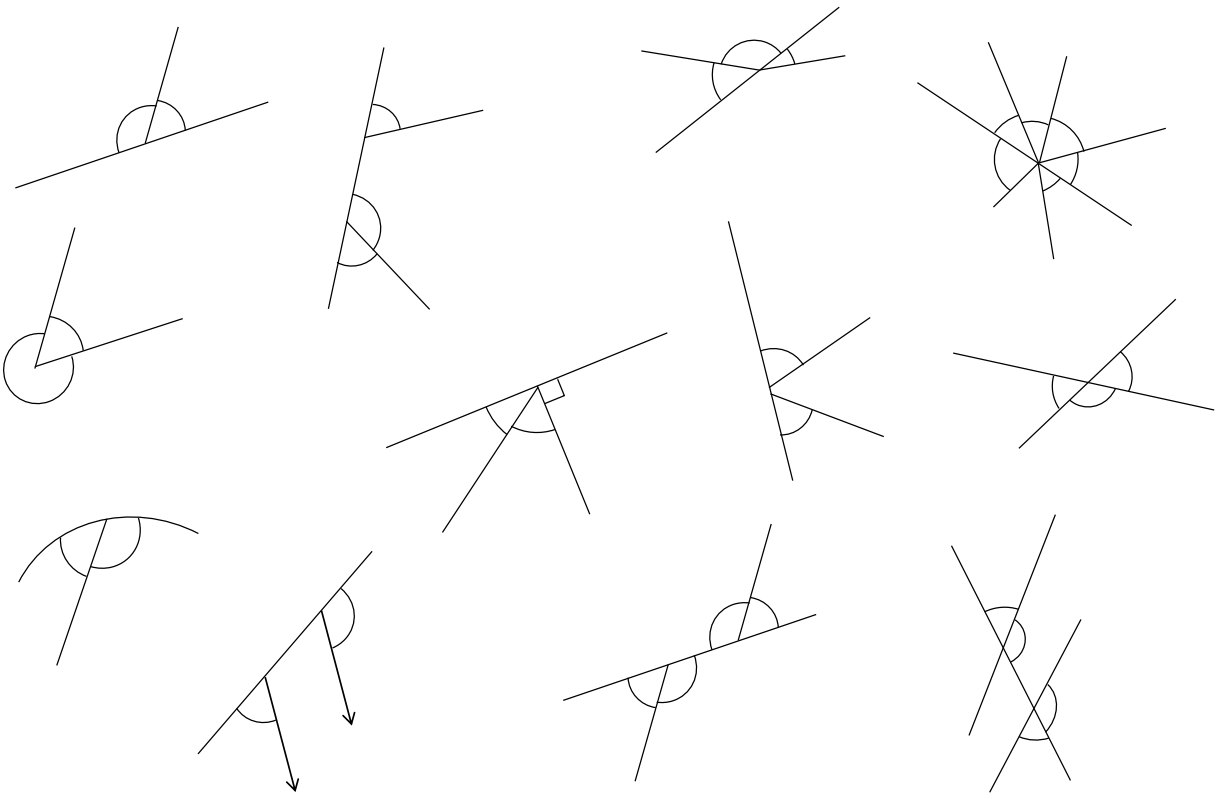
$\angle ABD =$



4.6 Angles on a Straight Line

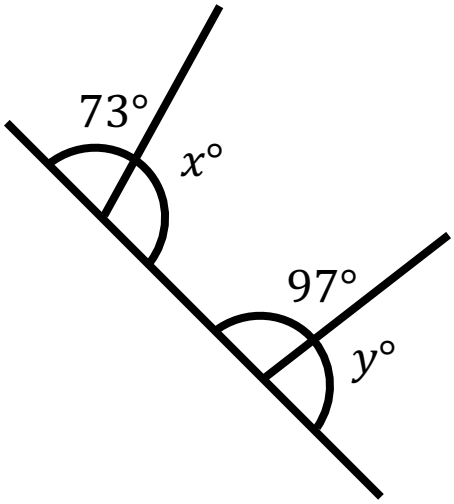
Highlight any angles that would add to 180°

Diagrams not drawn accurately



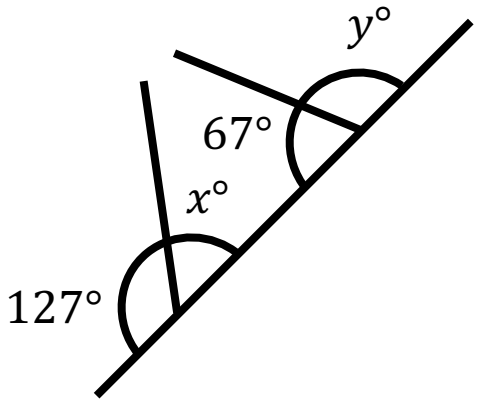
Worked Example

Find the values of x and y



Your Turn

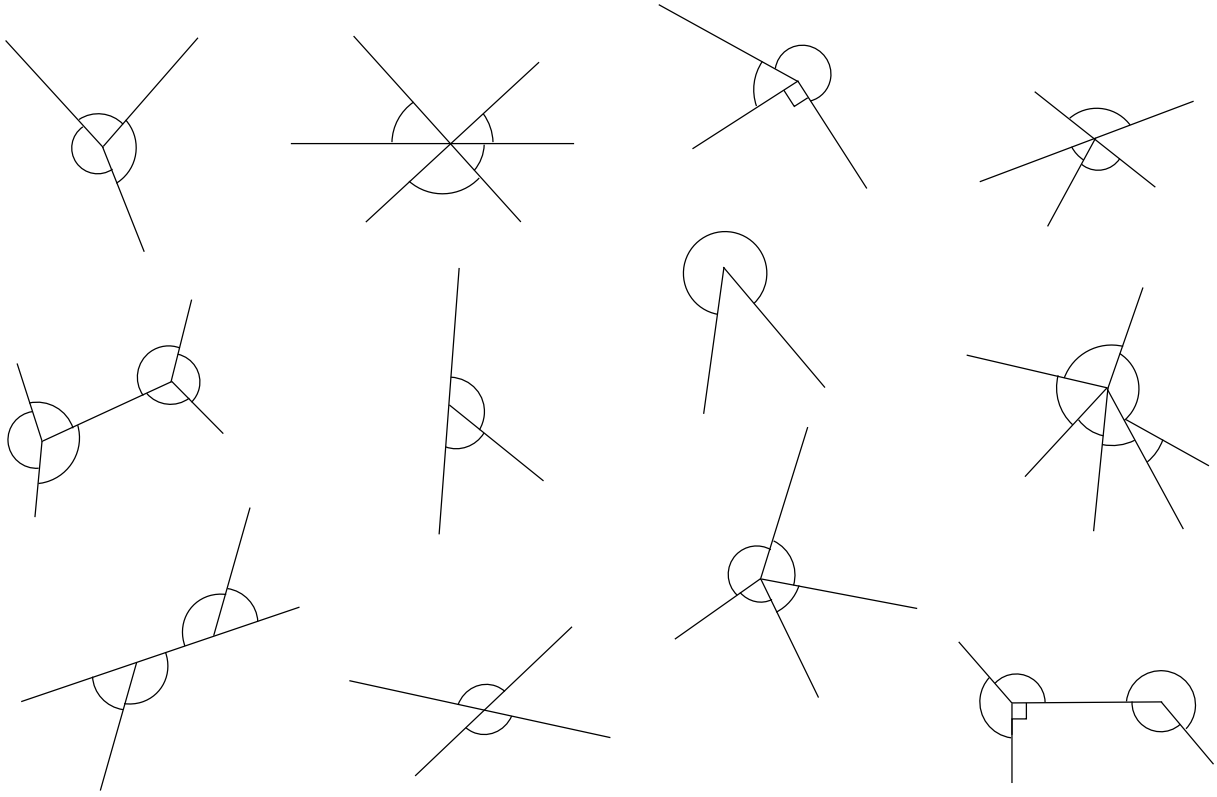
Find the values of x and y



4.7 Angles around a Point

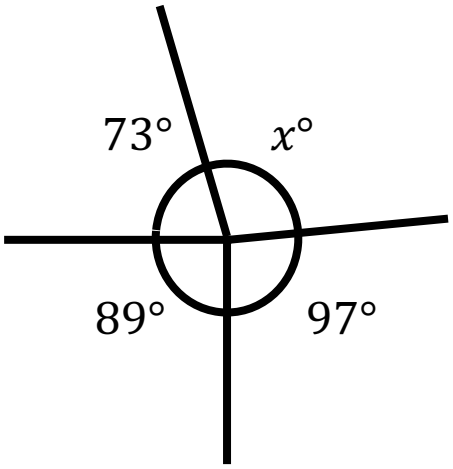
Highlight any angles that would add to 360°

Diagrams not drawn accurately



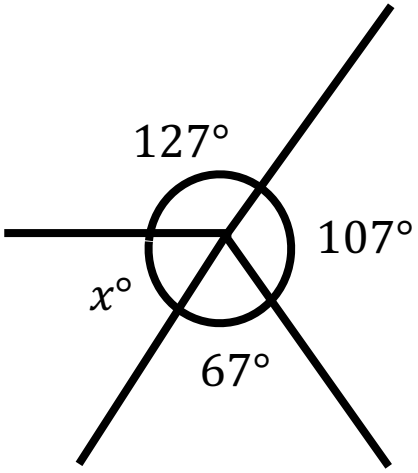
Worked Example

Find the value of x



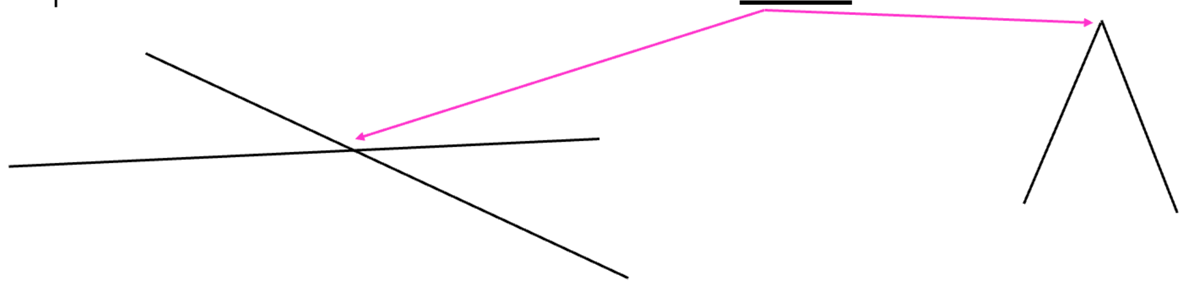
Your Turn

Find the value of x

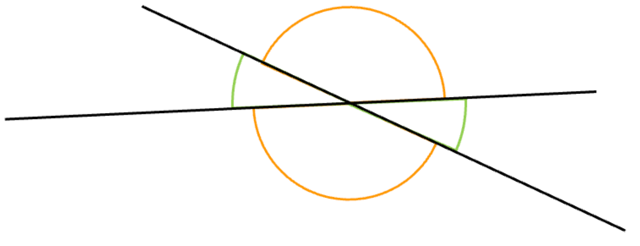


4.8 Vertically Opposite Angles

The point where two lines meet is called a <u>vertex</u>.

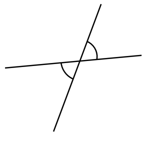


When two lines cross, they make four angles in <u>vertically opposite</u> pairs.



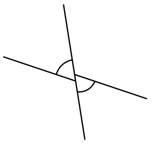
Decide which diagrams show vertically opposite angles

Diagrams not drawn accurately



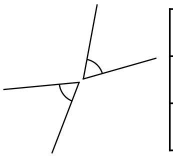
Vertically Opposite	
Not Vertically Opposite	
Cannot Tell	

Explain your reason



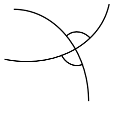
Vertically Opposite	
Not Vertically Opposite	
Cannot Tell	

Explain your reason



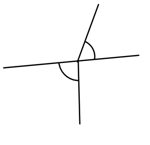
Vertically Opposite	
Not Vertically Opposite	
Cannot Tell	

Explain your reason



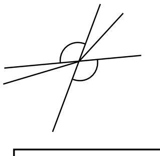
Vertically Opposite	
Not Vertically Opposite	
Cannot Tell	

Explain your reason



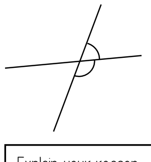
Vertically Opposite	
Not Vertically Opposite	
Cannot Tell	

Explain your reason



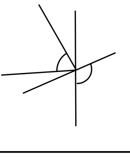
Vertically Opposite	
Not Vertically Opposite	
Cannot Tell	

Explain your reason



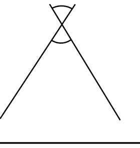
Vertically Opposite	
Not Vertically Opposite	
Cannot Tell	

Explain your reason



Vertically Opposite	
Not Vertically Opposite	
Cannot Tell	

Explain your reason

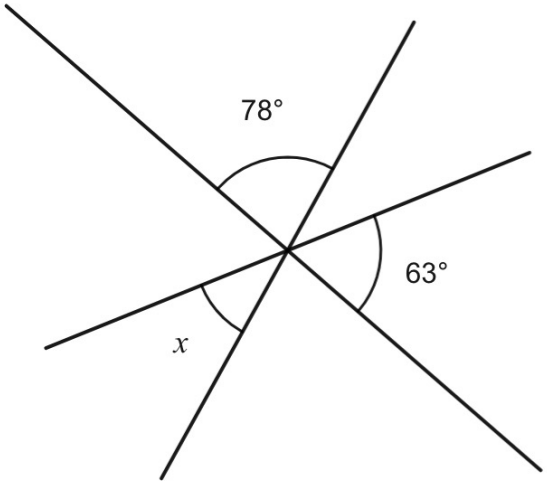


Vertically Opposite	
Not Vertically Opposite	
Cannot Tell	

Explain your reason

Worked Example

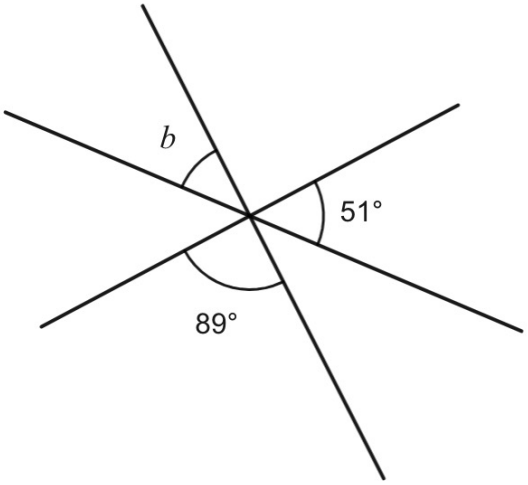
The diagram below shows three intersecting straight lines.



Find the value of x

Your Turn

The diagram below shows three intersecting straight lines.



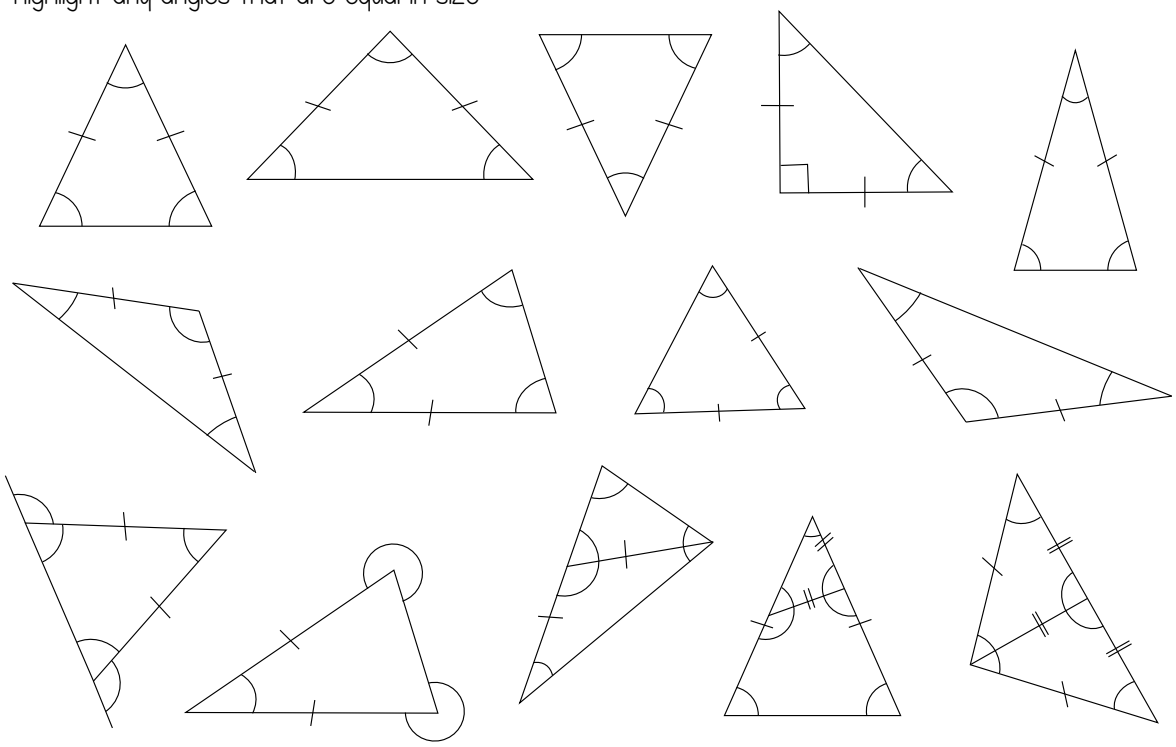
Find the value of b

Dr Frost 147a and 147b

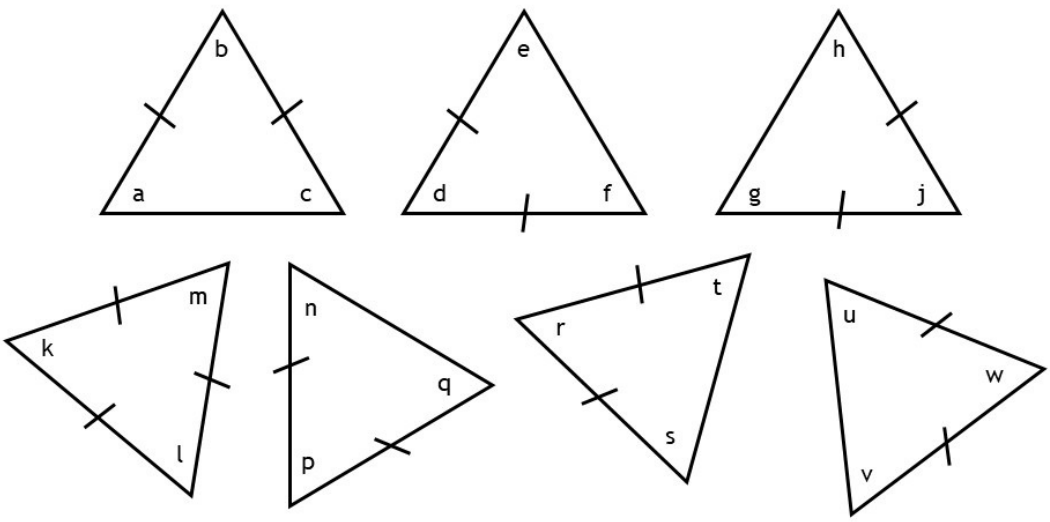
4.9 Angles in Triangles

Highlight any angles that are equal in size

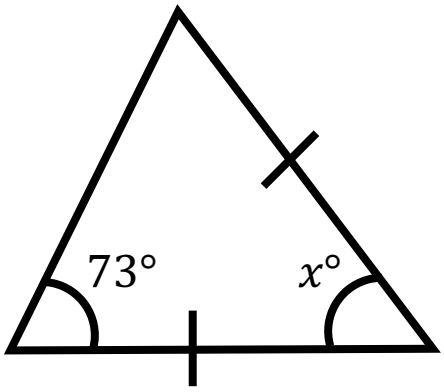
Diagrams are not drawn accurately

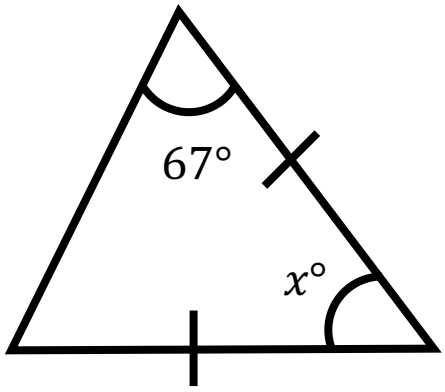


For each triangle, write down the letters of the angles with equal value.

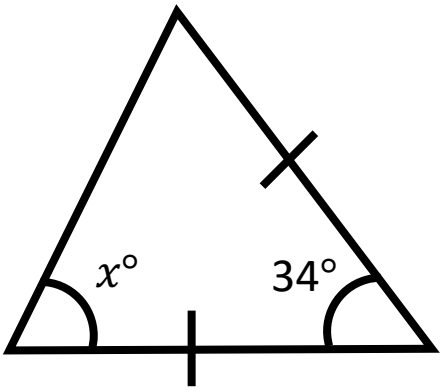


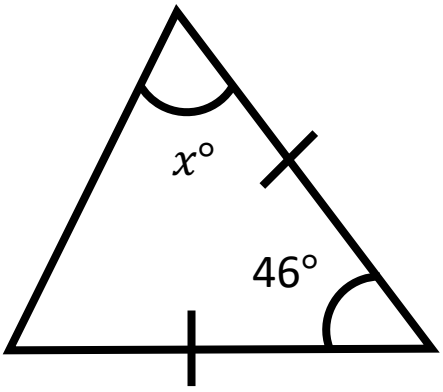
Worked Example	Your Turn
Find the value of x	Find the value of x





Worked Example	Your Turn
Find the value of x	Find the value of x

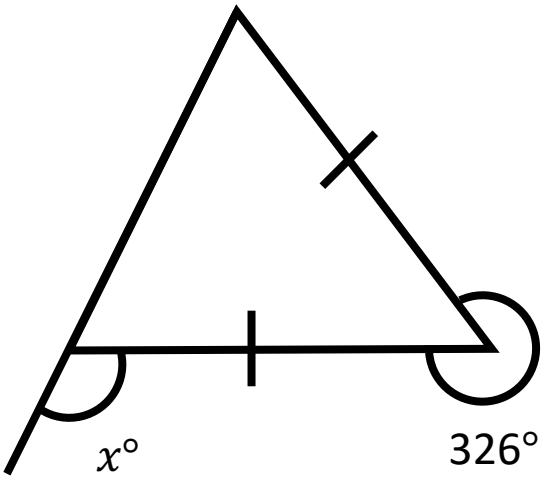




Dr Frost 149a, 149b and 150a

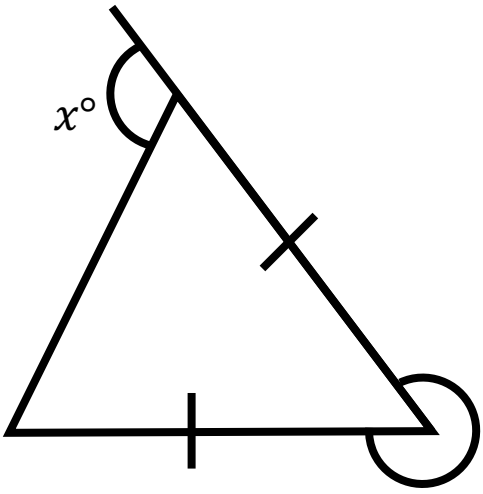
Worked Example

Find the value of x



Your Turn

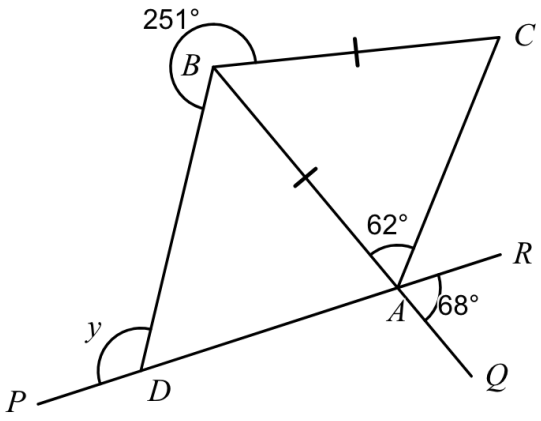
Find the value of x



Dr Frost 149c, 149d and 150b

Worked Example

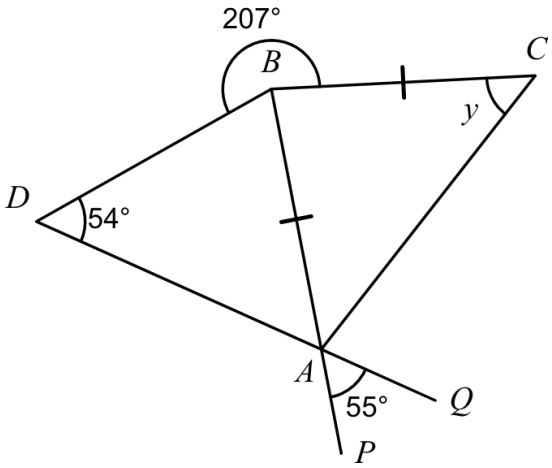
The diagram shows two triangles, ABC and ABD



ABC is an isosceles triangle. $RADP$ and BAQ are straight lines. Find the value of y

Your Turn

The diagram shows two triangles, ABC and ABD

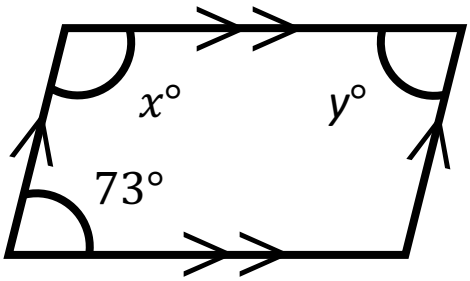


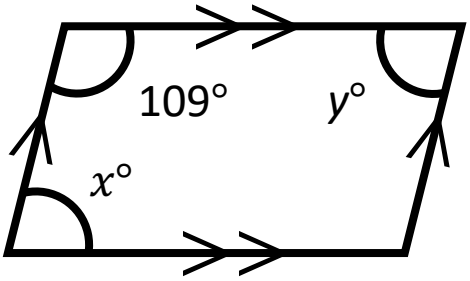
ABC is an isosceles triangle. BAP and DAQ are straight lines. Find the value of y

Dr Frost 149e and 150c

4.10 Angles in Quadrilaterals

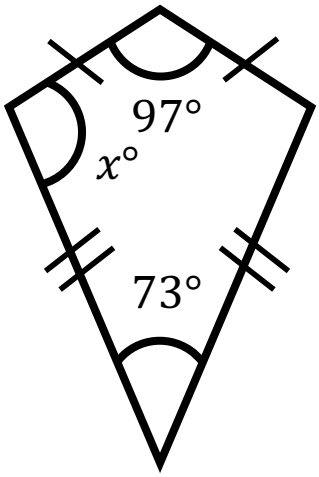
Worked Example	Your Turn
Find the values of x and y	Find the values of x and y





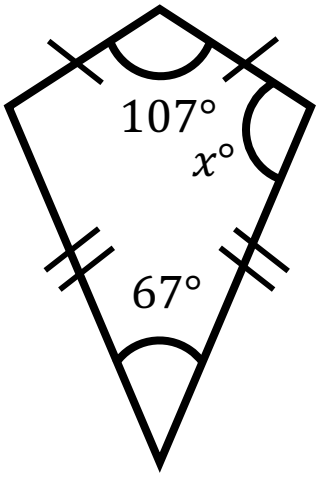
Worked Example

Find the value of x



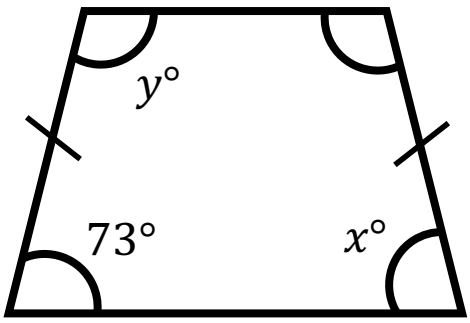
Your Turn

Find the value of x



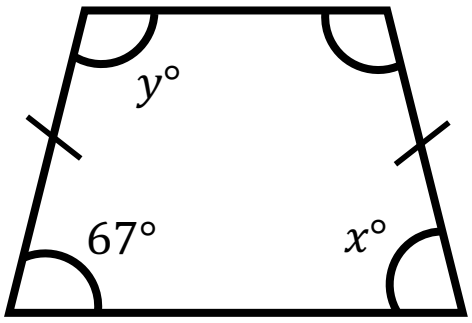
Worked Example

Find the values of x and y



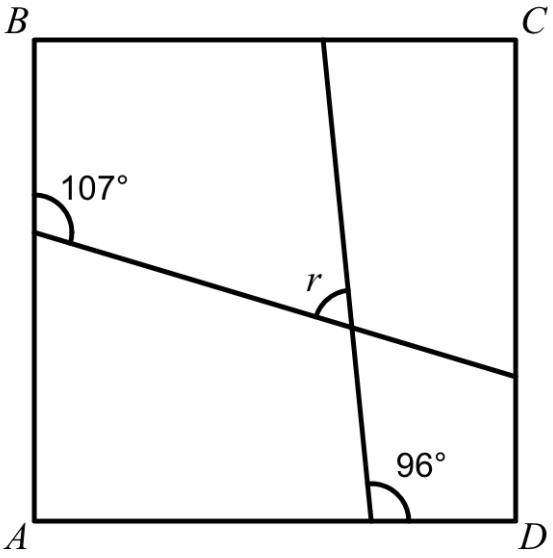
Your Turn

Find the values of x and y



Worked Example

Calculate the value of r, given that $ABCD$ is a square.



Your Turn

Calculate the value of r