



KING EDWARD VI
HANDSWORTH GRAMMAR
SCHOOL FOR BOYS



KING EDWARD VI
ACADEMY TRUST
BIRMINGHAM

2023 **Year 9** **2024**
Mathematics
Unit 15 Booklet

HGS Maths



Tasks



Dr Frost Course



Name: _____

Class: _____

Contents Page

- 1 [Percentages with Multipliers](#)
- 2 [Simple and Compound Interest](#)
- 3 [Similarity with Length](#)
- 4 [Right-Angled Trigonometry](#)

1 Percentages with Multipliers

Worked Example

Write down the multiplier:

To find 20%

To increase by 20%

To decrease by 20%

Your Turn

Write down the multiplier:

To find 30% ...

To increase by 30%

To decrease by 30%

Worked Example

Write down the multiplier:

To find 12.5%

To increase by 12.5%

To decrease by 12.5%

Your Turn

Write down the multiplier:

To find 0.5%

To increase by 0.5%

To decrease by 0.5%

Worked Example

Find 7% of 493.8

Your Turn

Find 2% of 34.32

Worked Example

- a) Increase 461.7 by 17%
- b) Decrease 461.7 by 17%

Your Turn

- a) Increase 295.6 by 18%
- b) Decrease 295.6 by 18%

Fill in the Gaps

Original Amount	Percentage	Increase/Decrease	Multiplier	Calculation	New Amount
£50	25%	<i>Increase</i>	1.25	$£50 \times 1.25$	£62.50
£70	16%	<i>Increase</i>	1.16		
£89	15%	<i>Decrease</i>	0.85		
£125	76%	<i>Increase</i>			
£49	36%	<i>Decrease</i>			
£218	92%	<i>Decrease</i>			
£24	8%		1.08		
£92			1.83		
£48			0.73		
£75	12.5%	<i>Increase</i>			
£13	8.5%	<i>Decrease</i>			
£54			0.635		

Fill in the Gaps

Increasing & Decreasing by a Percentage



Q	Whole	Increase or Decrease	Change		Decimal Multiplier		Result
			As a percentage	As a decimal	Calculation to Find		
A	400	+	20%	0.2	$1 + 0.2$	1.2	
B	300	+	80%				
C	800	+		0.15			
D	700	+				1.12	
E	900	+	3%				
F	600	-	30%				
G	200				$1 - 0.15$		
H	1400					0.35	
I	500					0.93	
J	250						500
K	700					2.35	
L	140	+	0.5%				
M	550	+	14.5%				
O	820	-	0.5%				
P	1600	-	32.8%				
Q	86	-	5.75%				

Worked Example

In a 24% sale, the price of a shirt is reduced by \$68.88. Find the original price of the shirt.

Your Turn

In a 3% sale, the price of a phone is reduced by \$2.82. Find the original price of the phone.

Worked Example

The price of a jumper is increased by 74% and now is \$581.16.
Find the original price.

Your Turn

The price of a jumper is increased by 68% and now is \$717.36.
Find the original price.

Fill in the Gaps

Question	Percentage Increase/Decrease	Multiplier	Calculation	Original Amount
After an increase of 10%, the price of a computer is £275. What was its original price?	10% <i>Increase</i>	1.1	$£275 \div 1.1$	£250
After an 8% pay rise, Omar earns £10.26 per hour. What was his hourly pay before the increase?	8% <i>Increase</i>	1.08		
A shirt is reduced by 20% to £20 in a sale. What was its original price?	20% <i>Decrease</i>	0.8	$£20 \div 0.8$	£25
The population of a village decreases by 16% to 1260. What was the population before the decrease?	16% <i>Decrease</i>	0.84		
A TV costs £258.42 including 18% tax. What was the price of the TV before the tax was added?	18% <i>Increase</i>			
A painting is sold for £729, making a profit of 35%. What was the original cost of the painting?				
In a sale, a coat is reduced by 33% to £43.55. What was its original price of the coat?				
A puppy increases in weight by 7.5% to 3.87 kg. What was the previous weight of the puppy?				
			$£92 \div 1.15$	
			$528 \div 0.88$	

Worked Example

The price of a computer increases from £452 to £619.24.
Determine the percentage change.

Your Turn

The price of a train ticket decreases from £294 to £244.02.
Determine the percentage change.

Fill in the Gaps

Round your answers to 1 decimal place where necessary.

Question	Actual Change	Original Amount	Calculation	Percentage Change
A population of butterflies grows from 500 to 562. What is the percentage change?	62	500	$\frac{62}{500} \times 100$	
Ayesha buys a bike for £3000 and sells it for £3200. What is her percentage profit?	£200	£3000		
Hassan's savings increased from £150 to £167.50. Find the percentage increase.	£17.50			
Leia buys a painting for \$700 and sells it for \$642. Work out her percentage loss.	\$58			
Tony's wages increase from £14.25 per hour to £15.85 per hour. What is the percentage increase?				
Eric buys a laptop for £550 and after 1 year it is worth £325. What is the percentage loss in its value?				
The population of a town increases from 56500 to 58900. What is the percentage growth?				
The price of a book is reduced from £7.99 to £6.49. Find the percentage decrease.				
Noah buys an antique clock for £45 and sells it for £150. Find his percentage profit.			$\frac{1.65}{7.50} \times 100$	
			$\frac{4}{30} \times 100$	

Worked Example

Original Amount: 40
Percentage: 24%

As a fraction

Multiplier

Percentage of...

Increased by...

Decreased by...

Your Turn

Original Amount: 40
Percentage: 72%

As a fraction

Multiplier

Percentage of...

Increased by...

Decreased by...

Fill in the Gaps

	Original Amount	Percentage	As a fraction	Multiplier	Percentage of...	Increased by...	Decreased by....
1.	60	20%					
2.	60		$\frac{3}{10}$				
3.	60			0.25			
4.		25%			7.5		
5.			$\frac{1}{40}$			30.75	29.25
6.	30				6.75		
7.				0.225	67.5		

Fill in the Gaps

	Original Amount	Percentage	As a fraction	Multiplier	Percentage of...	Increased by...	Decreased by...
8.	300		$\frac{41}{200}$				
9.	60					72.3	47.7
10.			$\frac{41}{40}$		61.5		
11.	60			1.125			
12.	6				0.675		
13.	6					24.675	
14.	6						-31.35

Fill in the Gaps

Fill in the gaps in the table.
The first one is done already.

	old price	new price	$\frac{\text{new price}}{\text{old price}}$	what's happened?
1	£34.00	£50.00	1.47	47% increase
2	£6.50	£7.20		
3	£8.50	£8.10		
4	£241.00			41% decrease
5	£78.20			4% increase
6	£1.60		1.24	
7	£852.10		0.30	
8	£29.00			32% decrease
9	£43.80			90% increase
10	£329.35	£400.00		
11	£22.00	£10.00		
12		£179.00	0.90	10% decrease
13		£4.00	1.15	15% increase
14		£11.00		16% increase
15		£11.11		8% decrease
16		£2.00		33% decrease
17		£1,499.00		17% increase
18		£8.50	1.09	
19	£8.00			10% decrease
20		£543.00		17% decrease

Fill in the Gaps

	Amount (A)	Percentage (P%)	P% of A	A increased by P%	A decreased by P%		Amount (A)	Percentage (P%)	P% of A	A increased by P%	A decreased by P%
1.	320	10 %	32	352	288	19.		10 %		88	
2.	320	25 %				20.	80		12		
3.	320	2.5 %				21.		80 %	12		
4.	320	1.25 %				22.			12	52	
5.	80	1.25 %				23.			12		48
6.	400	1.25 %				24.			12		-2
7.	125		5			25.		5 %	12		
8.		4 %	10			26.			12	13	
9.	250		20			27.	10			13	
10.	625	16 %				28.		25 %		13	
11.	1859	16 %				29.				13	12
12.	1234	16 %				30.	15				12
13.	609		97.44			31.		25 %			12
14.	84			97.44		32.			68		12
15.	116				97.44	33.				468	12
16.	116	160 %				34.		97.5 %			12
17.	116				-116	35.		2.5 %			468
18.	348	66 $\frac{2}{3}$ %				36.				328	312

Fill in the Gaps

	Amount (A)	Percentage (P%)	P% of A	A increased by P%	A decreased by P%
1.		64 %	377 856		
2.		64 %		377 856	
3.		64 %			377 856
4.		42 %			
5.		42 %			
6.		42 %			
7.			313 344		
8.				313 344	
9.					313 344
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					

- a) Complete rows 1-3.
Why was 377 856 chosen for those rows?
- b) What number could be used in rows 4-6 to have the same effect?
Use that number to complete those rows.
- c) What percentage could be used in rows 7-9 to have the same effect?
Use that percentage to complete those rows.
- d) Find composite numbers for **A** and **P** such that **P% of A** is a prime number.
Use such pairs to complete rows 10-12.
- e) Find composite numbers for **A** and **P** such that **A increased by P%** is a prime number.
Use such pairs to complete rows 13-15.
- f) Find composite numbers for **A** and **P** such that **A decreased by P%** is a prime number.
Use such pairs to complete rows 16-18.

Fill in the Gaps

	Question	New %	Multiplier	Calculation	Answer
a	Increase 15 by 54%	154%	1.54	1.54×15	
b	Decrease 30 by 23%	77%	0.77	$\times 30$	
c	Increase 14 by 65%	165%		\times	
d	Decrease 35 by 34%			\times	
e	Increase 22 by	105%		\times	
f	Decrease by		0.7	$\times 33$	
g	Increase by			1.1×21	
h	by			0.55×42	
i	by			1.155×20	
j	Decrease 25 by 7.6%			\times	
k	Decrease 24 by 3.75%			\times	
l	Increase 12 by 92.5%			\times	
m	28 by			\times	23.1
n	by 47.5%			\times	23.1

Extra Notes

2 Simple and Compound Interest

Simple Interest

Worked Example

Mr Bansal invests £850 into a savings account.
Mr Bansal gets 3.75% per year simple interest.
Work out the total interest Mr Bansal will get after 12 years.

Your Turn

Mr Dhillow invests £2810 into a savings account.
Mr Dhillow gets 4.75% per year simple interest.
Work out the total interest Mr Dhillow will get after 12 years.

Worked Example

£2000 is invested at 10% **simple** interest.

- a) What is the value at the end of year 1?
- b) What is the value at the end of year 2?
- c) What is the value at the end of year 20?

Your Turn

£4000 is invested at 10% **simple** interest.

- a) What is the value at the end of year 1?
- b) What is the value at the end of year 2?
- c) What is the value at the end of year 20?

Worked Example

- 1) £2000 is invested for 1 year.
The value after 1 year is £2200.
What is the simple rate of interest?

- 2) £2000 is invested for 2 years.
The value after 2 years is £2200.
What is the simple rate of interest?

Your Turn

- 1) £2000 is invested for 1 year.
The value after 1 year is £2400.
What is the simple rate of interest?

- 2) £2000 is invested for 5 years.
The value after 5 years is £2400.
What is the simple rate of interest?

Repeated Percentage Change

Worked Example

Write down the multiplier to increase by 20% then decrease by 20%

Your Turn

Write down the multiplier to decrease by 30% then increase by 30%

Fill in the Gaps

Q	Original amount	Percentage change 1	Percentage change 2	Overall percentage change	New amount
1	£200	Increase by 20%	Decrease by 20%		
2	£200	Decrease by 20%	Increase by 20%		
3	£200	Decrease by 20%			£200
4	£200	Decrease by 20%	Decrease by 20%		
5	£200	Increase by 20%	Increase by 20%		
6		Increase by 20%	Increase by 50%		£288
7		Increase by 20%		Increase by 50%	£288
8		Decrease by 20%	Decrease by 37.5%		£288
9	£576	Decrease by 20%		Increase by 50%	
10	£576	Increase by 20%		Decrease by 50%	
11	£576	Decrease by 50%			£576
12	£576	Increase by 50%	Decrease by 100%		

Fill in the Gaps

Section 1: Complete the table

Repeated percentage change

1 st percentage change	1 st percentage multiplier	2 nd percentage change	2 nd percentage multiplier	Overall percentage change	Overall percentage multiplier
30% increase	× 1.3	15% increase	× 1.15	49.5% increase	× 1.495
15% increase		30% increase			
20% increase		25% increase			
5% increase		40% increase			
7.5% increase			× 1.375		
	× 1.06		× 1.39		
	× 1.2				× 1.68
		50% increase		68% increase	
10% decrease		10% decrease			
20% decrease		20% decrease			
30% decrease		30% decrease			
30% decrease		30% increase			
30% increase		10% decrease			
	×0.85				× 1.19
			×0.92	35.6% decrease	

Worked Example

A television costs £500
The price is increased by 10%
A month later the price is increased by another 10%
What is the final price of the television?
How much more is the television now?

Your Turn

A television costs £400
The price is increased by 10%
A month later the price is increased by another 10%
What is the final price of the television?
How much more is the television now?

Worked Example

A television costs £500
The price is decreased by 10%
A month later the price is decreased by another 10%
What is the final price of the television?
How much less is the television now?

Your Turn

A television costs £400
The price is decreased by 10%
A month later the price is decreased by another 10%
What is the final price of the television?
How much more is the television now?

Compound Interest

Worked Example

Mr Bansal buys a car for £17150 which depreciates in value at a rate of 4% per year. Work out how much Mr Bansal's car will be worth in 14 years.

Your Turn

Mr Dhillow buys a car for £14680 which appreciates in value at a rate of 1.25% per year. Work out how much Mr Dhillow's car will be worth in 17 years.

Worked Example

A person invests £400 at 5% compound interest per annum. After x years they have £463.05. Find the value of x .

Your Turn

A person invests £400 at 6% compound interest per annum. After x years they have £476.40. Find the value of x .

Worked Example

Person A invests a sum of money. The account pays 5% compound interest per annum. After how many years will A have trebled their investment (as a whole number of years)?

Your Turn

Person A invests a sum of money. The account pays 6% compound interest per annum. After how many years will A have trebled their investment (as a whole number of years)?

Worked Example

A person invests £400 at 5% compound interest per annum.
How much interest has been earned after three years?

Your Turn

A person invests £400 at 3% compound interest per annum.
How much interest has been earned after 5 years?

Worked Example

A person invests £400 at $x\%$ compound interest per annum. After 3 years they have £463.05. Find the value of x .

Your Turn

A person invests £400 at $x\%$ compound interest per annum. After 3 years they have £476.40. Find the value of x .

Worked Example

A person invests $\pounds x$ at 5% compound interest per annum. After 3 years they have $\pounds 463.05$. Find the value of x .

Your Turn

A person invests $\pounds x$ at 6% compound interest per annum. After 3 years they have $\pounds 476.40$. Find the value of x .

Fill in the Gaps

Compound Growth & Decay

$$\text{original} \times \text{multiplier}^{\text{years}} = \text{final}$$



	Original Quantity	Yearly Growth Rate	Multiplier (M)	Years	Formula	Rearranged Formula (unknown as subject)	Final Quantity
a	400	+30%	1.3	2	$400 \times 1.3^2 = \text{final}$	x	
b	400	+3%		2	$\times 1.03^2 = \text{final}$	x	
c	400	+12%		3		x	
d	600		1.05	4		x	
e	400	-20%			$400 \times 0.8^2 = \text{final}$	x	
f	400	-2%		2		x	
g					$400 \times 0.88^3 = \text{final}$	x	
h	600	-33%		4		x	
i		+20%			$\text{original} \times 1.2^2 = 720$	$\text{original} = 720 \div 1.2^2$	720
j		+8%			$\text{original} \times 1.08^3 =$		755
k			0.6	2			800
l		-15%		3			430
m	800			2	$800 \times M^2 = 968$	$M = \sqrt[2]{968 \div 800}$	968
n	500			3			630

Fill in the Gaps

Original Amount	Interest Rate	Multiplier	Number of Years	Calculation	Final Amount
£100	5%	1.05	10	100×1.05^{10}	£162.89
£100	4%	1.04	10		
£200	6%		8		
£250	3%		6		
£1200	6%		5		
£700	2.5%		3		
£500	1.5%		7		
£250		1.06	4		
£325		1.025	5		
				$£400 \times 1.03^6$	
				$£7000 \times 1.02^3$	
£400	5%				£510.51
£250	3%				£326.19
£600			8		£703
		1.025	6		£347.91
	6.5%		4		£932.69

Fill in the Gaps

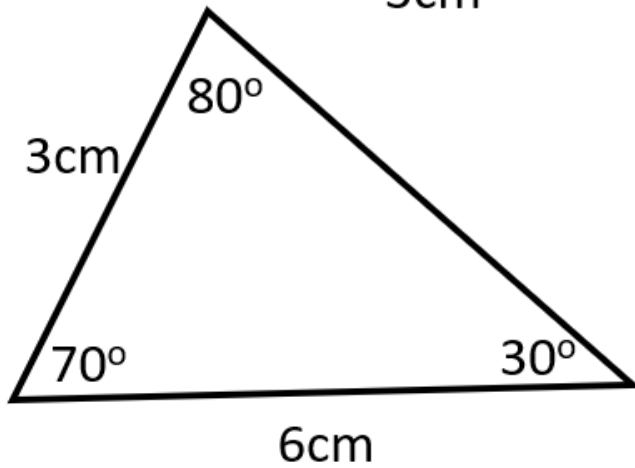
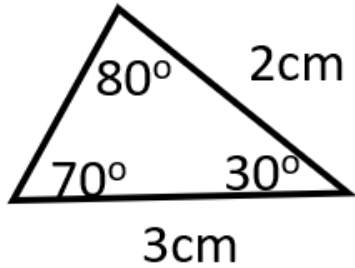
Q	Yearly percentage change	Original Amount	Amount after 5 years	Amount after 10 years
1	100%	£1		
2	50%	£1		
3	5%	£1		
4	-50%	£2,048		
5	25%		£20	
6	-25%		£20	
7	7%		£1	
8	100%			£2,048
9	5%			£100
10	100%			£2,048
11		£20	£30	
12		£1	£5	
13		£1	£10	
14			£50	£100
15		£4		£64

Extra Notes

3 Similarity with Length

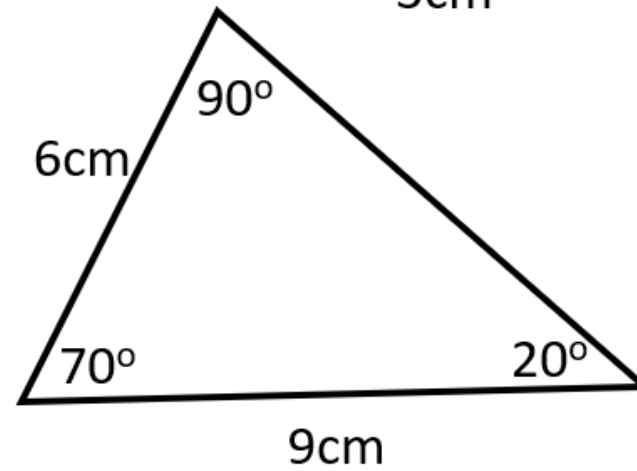
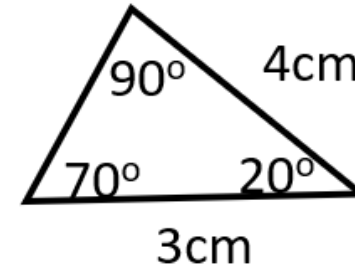
Worked Example

What is the scale factor? Find the missing lengths.



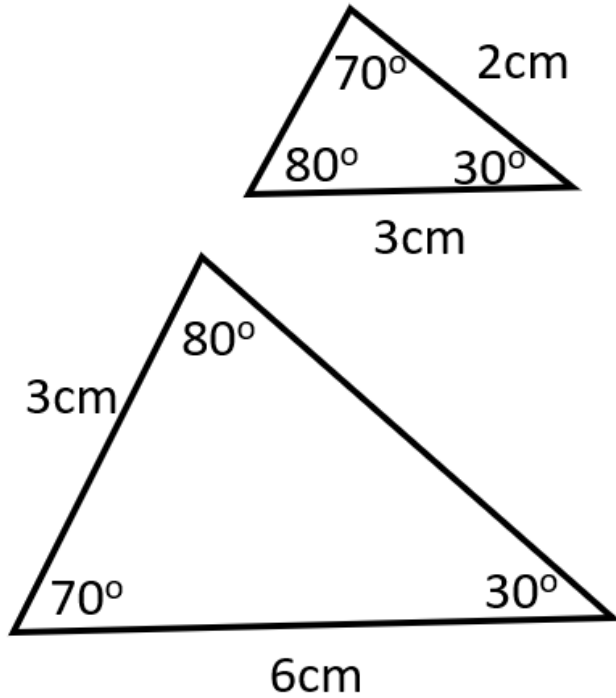
Your Turn

What is the scale factor? Find the missing lengths.



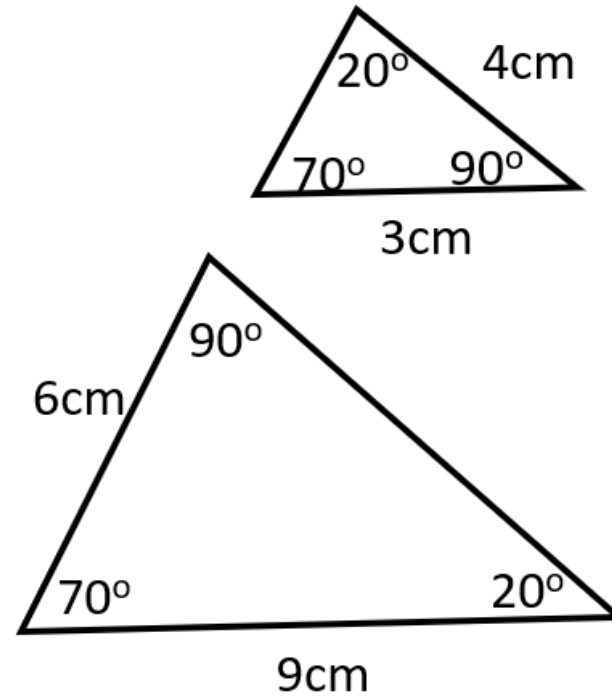
Worked Example

What is the scale factor? Find the missing lengths.



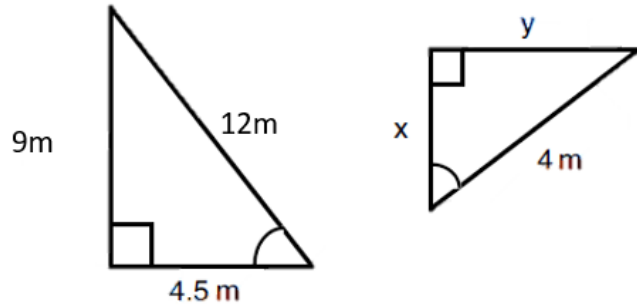
Your Turn

What is the scale factor? Find the missing lengths.



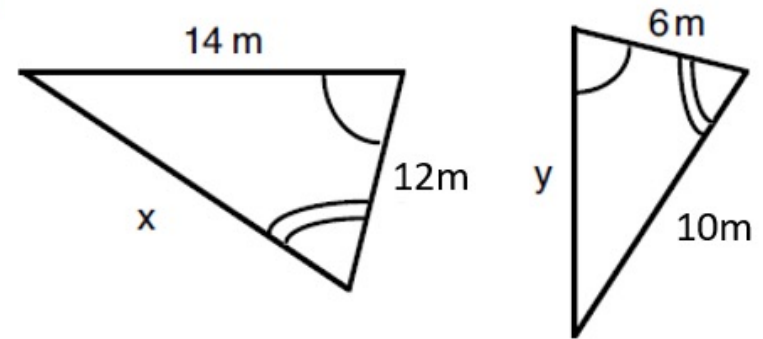
Worked Example

What is the scale factor? Find the missing lengths.



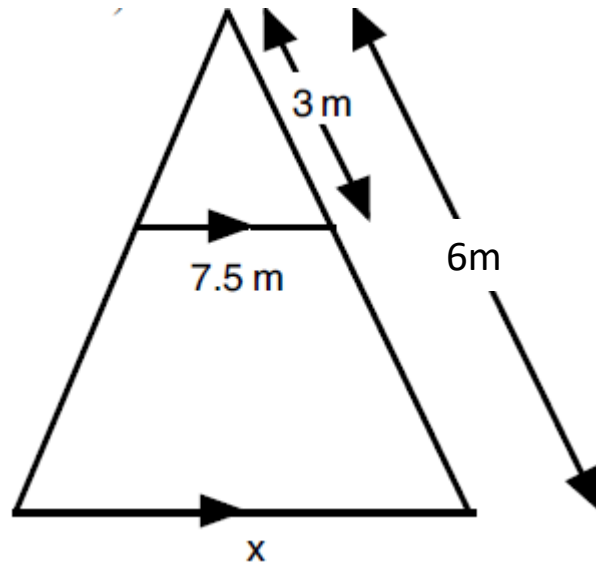
Your Turn

What is the scale factor? Find the missing lengths.



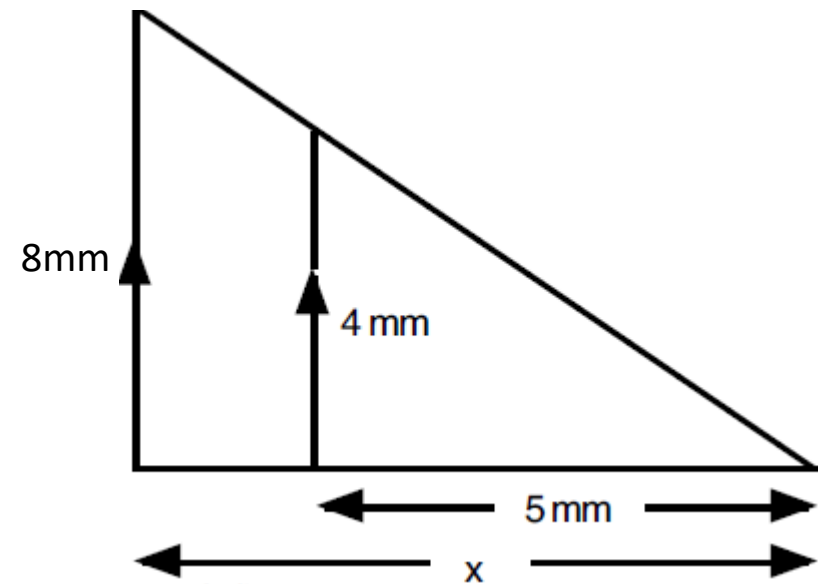
Worked Example

Find the length of every missing side



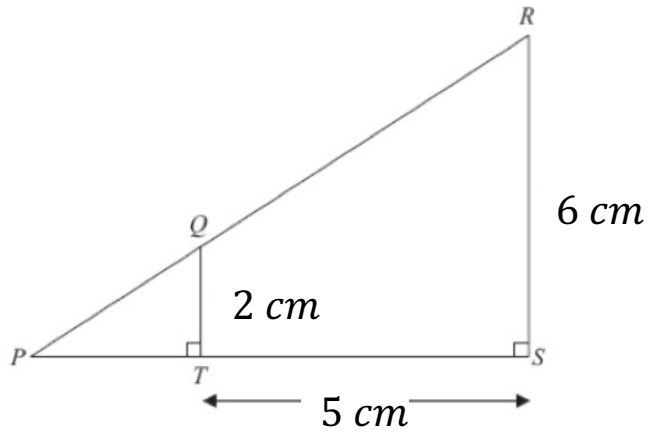
Your Turn

Find the length of every missing side



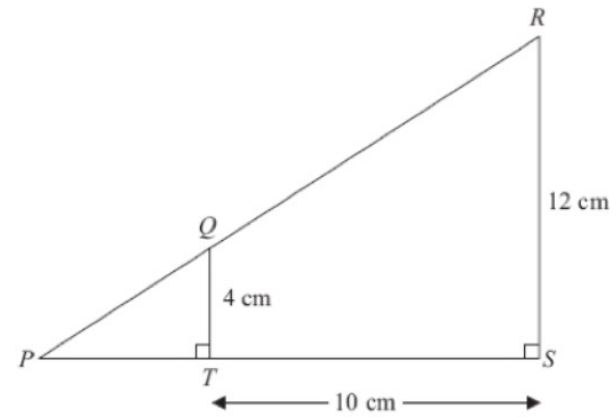
Worked Example

Calculate the length of PT



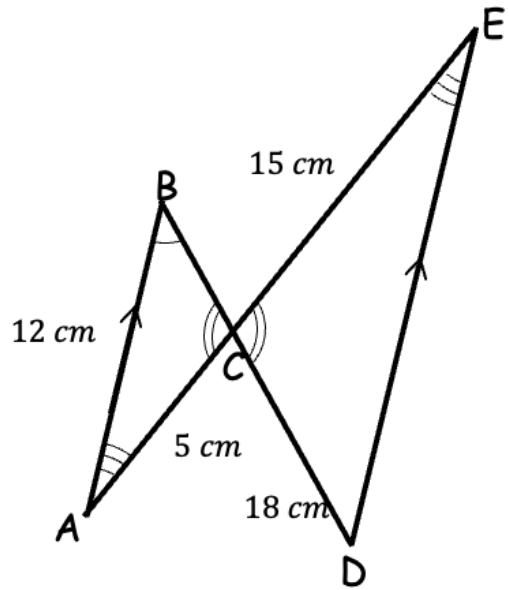
Your Turn

Calculate the length of PT



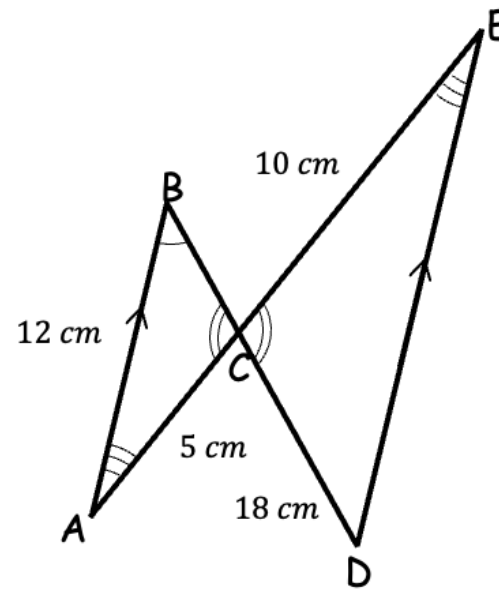
Worked Example

Calculate the missing lengths



Your Turn

Calculate the missing lengths



Extra Notes

4 Right-Angled Trigonometry

Worked Example

Find 'x'. Give your solution to 2 decimal places if required.

a) $\sin(60) = \frac{x}{5}$

b) $\cos(45) = \frac{5}{x}$

Your Turn

Find 'x'. Give your solution to 2 decimal places if required.

a) $\sin(60) = \frac{x}{4}$

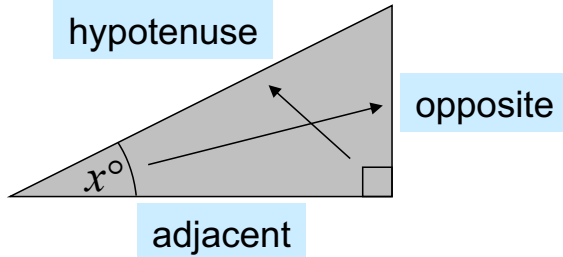
b) $\cos(45) = \frac{4}{x}$

Trigonometric Functions

A function $f(x)$ takes an input x and outputs a value y . A trigonometric function takes an angle x° and outputs a ratio of sides.

For any right-angled triangle we always label the longest side as the hypotenuse (H). For the purposes of trigonometry, we label the other two sides relative to one of the non-right angles.

In order to understand and use some other rules connecting the sides & angle of right-angled triangles, we introduce a system for labelling the three sides:

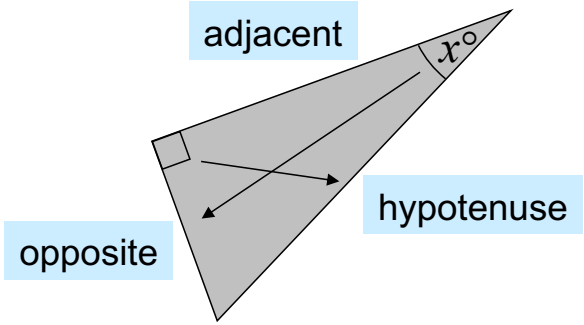


The **hypotenuse** is the longest side, always opposite the right-angle

The **opposite** is always from the angle θ

The **adjacent** is the remaini next to the angle θ

You must be able to correctly recognise the hypotenuse, opposite and adjacent side for any given right-angled triangle and angle



Trigonometric Functions

A function $f(x)$ takes an input x and outputs a value y . A trigonometric function takes an angle x° and outputs a ratio of sides.

The three sides of right-angled triangles are:

O – Opposite

A – Adjacent

H – Hypotenuse

The next section considers the **ratios** between the hypotenuse, opposite and adjacent, relative to angle x , in a right-angled triangle.

The ratio of the opposite to the hypotenuse is called **sine**

The ratio of the adjacent to the hypotenuse is called **cosine**

The ratio of the opposite to the adjacent is called **tangent**

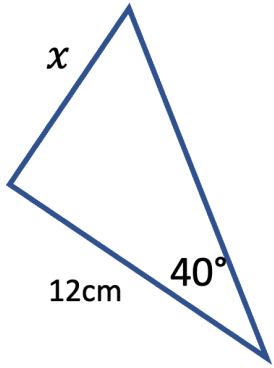
These are abbreviated as **sin**, **cos** and **tan**

$$\sin x = \frac{O}{H} \quad \cos x = \frac{A}{H} \quad \tan x = \frac{O}{A}$$

This is commonly given the acronym: **SOHCAHTOA**

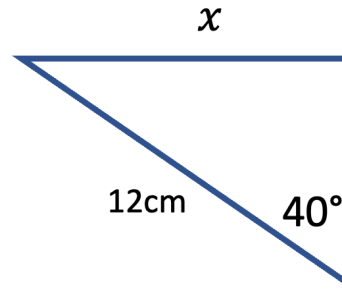
Worked Example

Choose the correct ratio to calculate side x

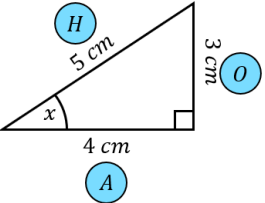
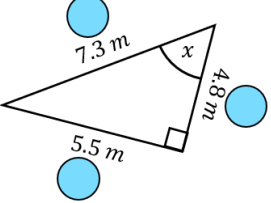
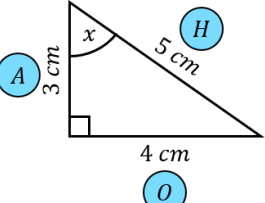
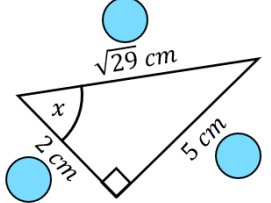
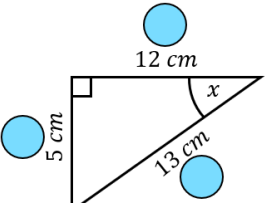
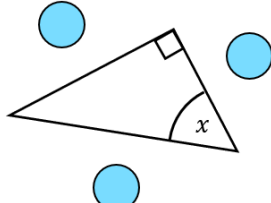
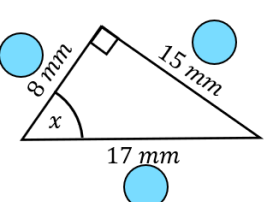
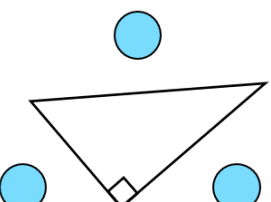


Your Turn

Choose the correct ratio to calculate side x

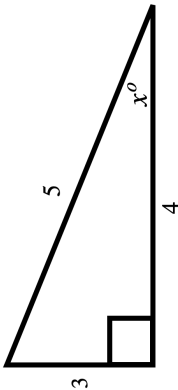
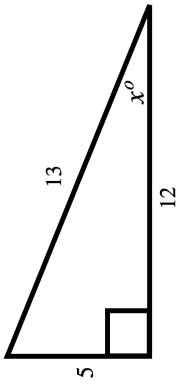
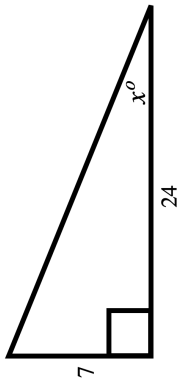
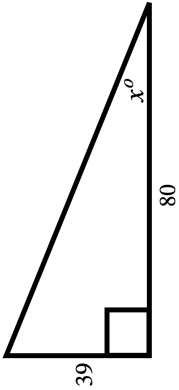
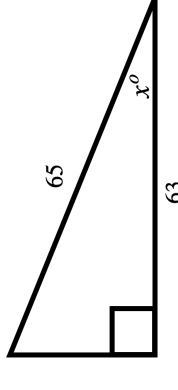
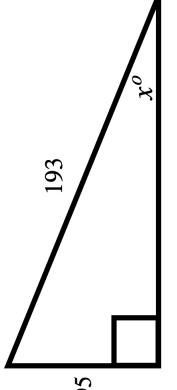


Fill in the Gaps

Labelled diagram	Sine Ratio	Cosine Ratio	Tangent Ratio	Labelled diagram	Sine Ratio	Cosine Ratio	Tangent Ratio
	$\sin x = \frac{3}{5}$	$\cos x = \frac{4}{5}$	$\tan x = \frac{\square}{\square}$		$\sin x = \frac{\square}{\square}$	$\cos x = \frac{\square}{\square}$	$\tan x = \frac{\square}{\square}$
	$\sin x = \frac{\square}{\square}$	$\cos x = \frac{\square}{\square}$	$\tan x = \frac{\square}{\square}$		$\sin x = \frac{\square}{\square}$	$\cos x = \frac{\square}{\square}$	$\tan x = \frac{\square}{\square}$
	$\sin x = \frac{\square}{\square}$	$\cos x = \frac{\square}{\square}$	$\tan x = \frac{\square}{\square}$		$\sin x = \frac{\square}{\square}$	$\cos x = \frac{\square}{\square}$	$\tan x = \frac{9.9}{2}$
	$\sin x = \frac{\square}{\square}$	$\cos x = \frac{\square}{\square}$	$\tan x = \frac{\square}{\square}$		$\sin x = \frac{4}{7}$	$\cos x = \frac{\square}{\square}$	$\tan x = \frac{\square}{\square}$

Fill in the Gaps

For each triangle, write down the value of each trigonometric ratio:

<i>Triangle</i>	$\sin x^\circ$	$\cos x^\circ$	$\tan x^\circ$
			
			
			
			
			
			

Diagrams not drawn to scale

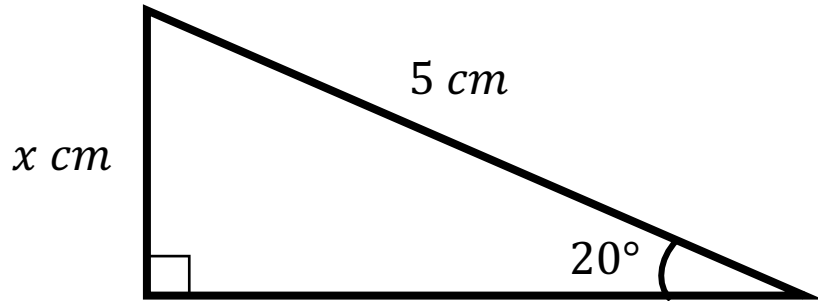
Fill in the Gaps

Complete the table:

<i>Triangle</i>	$\sin x^\circ$	$\cos x^\circ$	$\tan x^\circ$
	$\frac{5}{13}$		
	$\frac{15}{17}$		
		$\frac{3}{5}$	
			$\frac{4}{3}$
			$\frac{12}{5}$
		$\frac{2}{3}$	
			$\frac{1}{7}$
	$\frac{1}{\sqrt{3}}$		

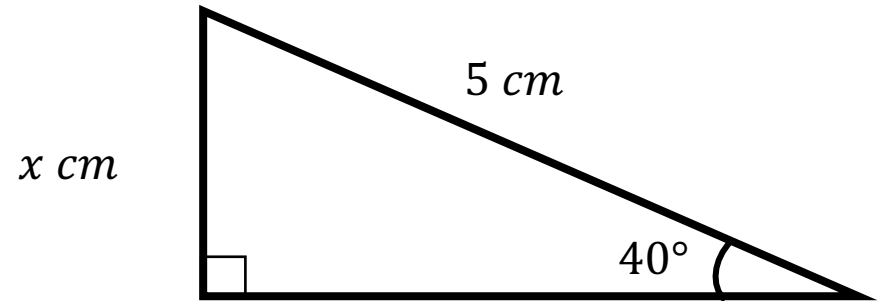
Worked Example

Calculate x . Round your answer to 1 decimal place.



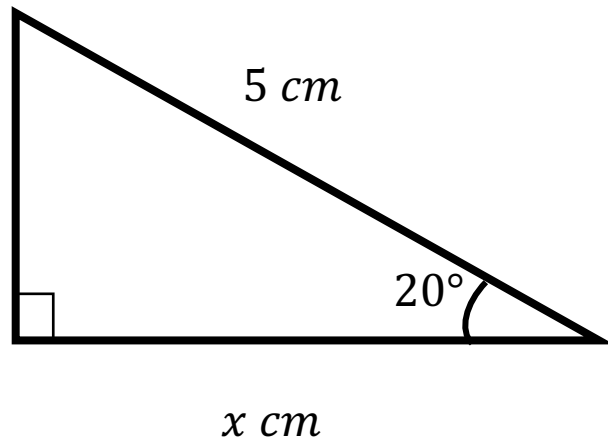
Your Turn

Calculate x . Round your answer to 1 decimal place.



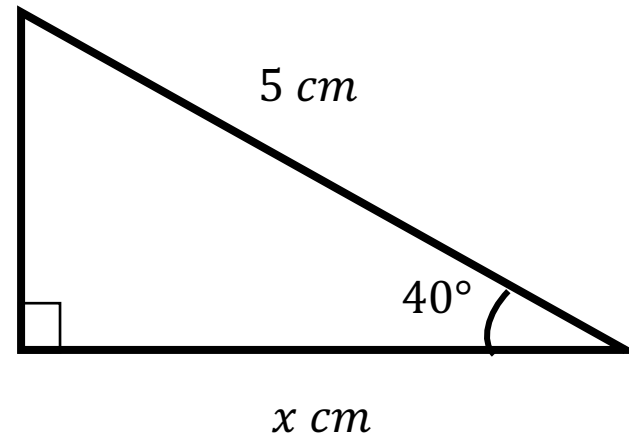
Worked Example

Calculate x . Round your answer to 1 decimal place.



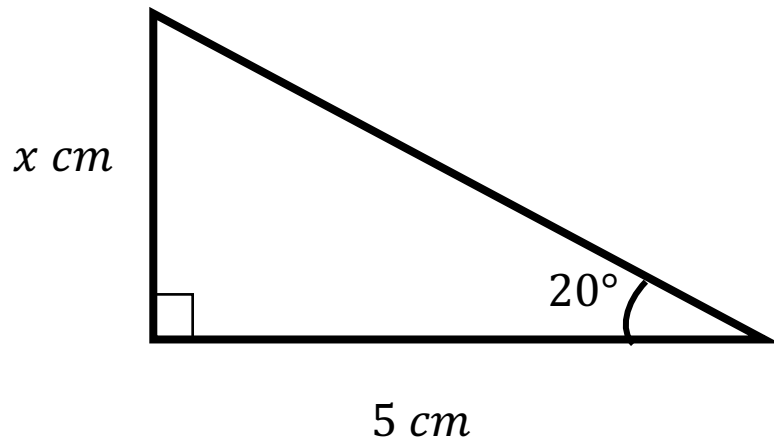
Your Turn

Calculate x . Round your answer to 1 decimal place.



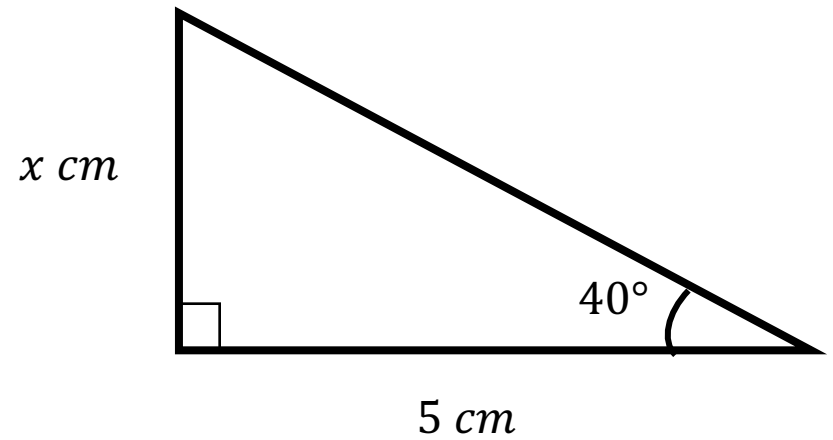
Worked Example

Calculate x . Round your answer to 1 decimal place.



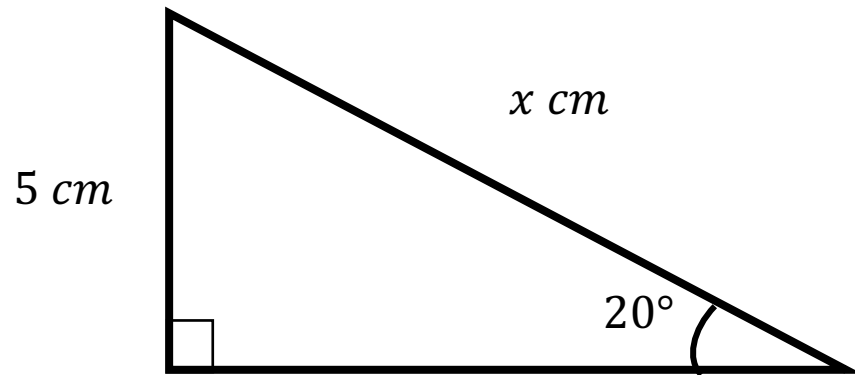
Your Turn

Calculate x . Round your answer to 1 decimal place.



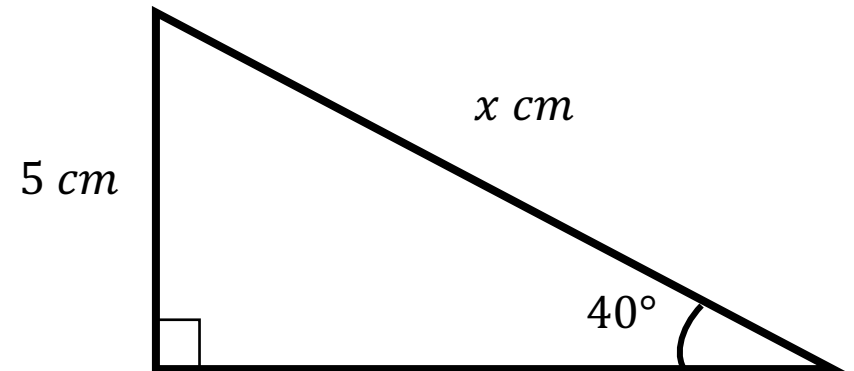
Worked Example

Calculate x . Round your answer to 1 decimal place.



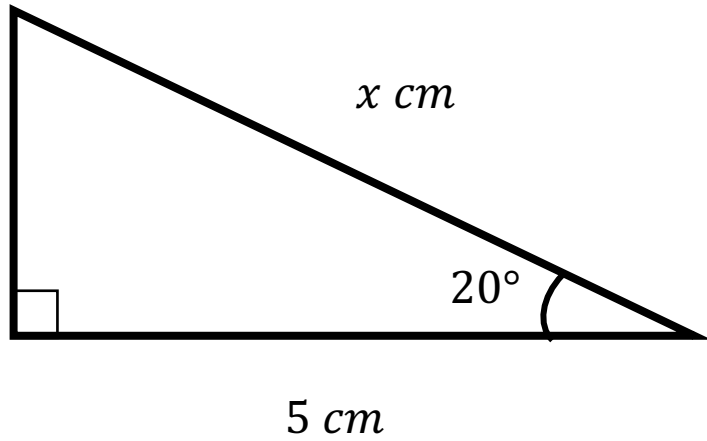
Your Turn

Calculate x . Round your answer to 1 decimal place.



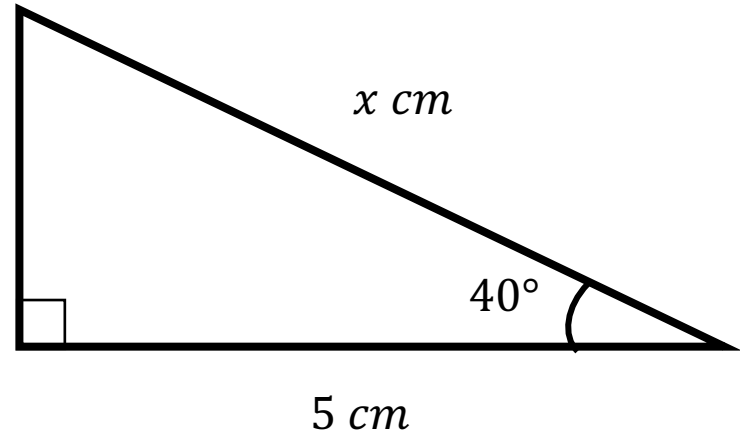
Worked Example

Calculate x . Round your answer to 1 decimal place.



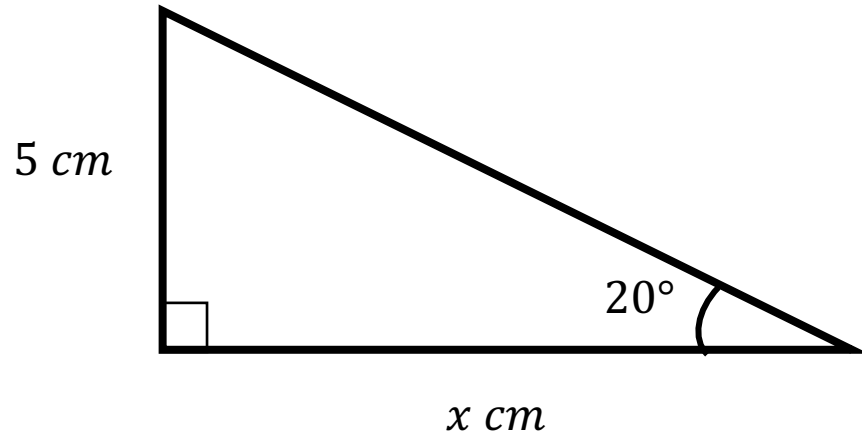
Your Turn

Calculate x . Round your answer to 1 decimal place.



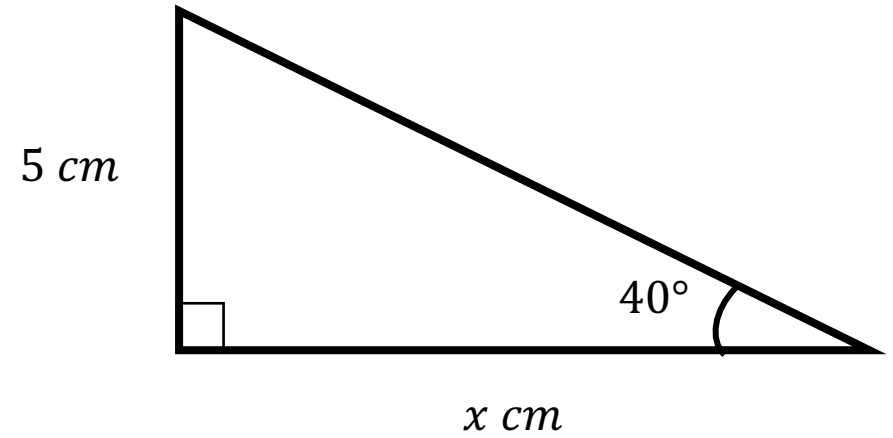
Worked Example

Calculate x . Round your answer to 1 decimal place.



Your Turn

Calculate x . Round your answer to 1 decimal place.



Fill in the Gaps

Labelled diagram	Choose ratio	Substitute into formula	Rearrange formula	Answer (1dp)
	sin	$\sin 38 = \frac{x}{11}$	$x = 11 \times \sin 38$	
	tan			
	cos	$\cos 28 = \frac{8}{x}$	$x = \frac{8}{\cos 28}$	
	tan			
		$\tan 68 = \frac{7}{x}$		

Inverse Trigonometric Functions

We have met the idea that if $f(x) = y$ then $f^{-1}(y) = x$

The trigonometric functions \sin , \cos and \tan are all functions where the input is an angle giving an output which is a ratio of sides.

The inverse of these functions therefore does this in reverse.

If $\sin(30^\circ) = 0.5$ then $\sin^{-1}(0.5) = 30^\circ$

If $\cos(60^\circ) = 0.5$ then $\cos^{-1}(0.5) = 60^\circ$

If $\tan(45^\circ) = 1$ then $\tan^{-1}(1) = 45^\circ$

Worked Example

Find ' x '. Give your solution to 2 decimal places.

$$\sin(x) = \frac{2}{3}$$

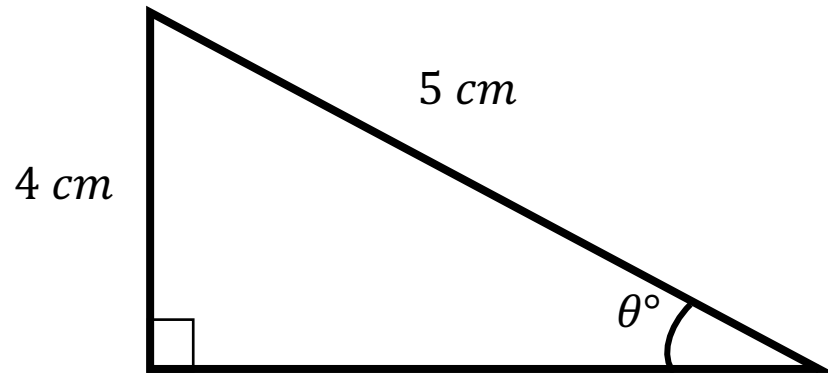
Your Turn

Find ' x '. Give your solution to 2 decimal places.

$$\cos(x) = \frac{2}{3}$$

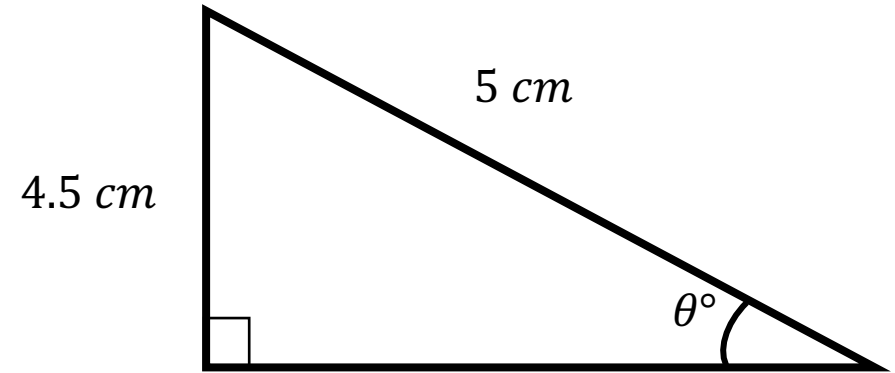
Worked Example

Calculate θ . Round your answer to 1 decimal place.



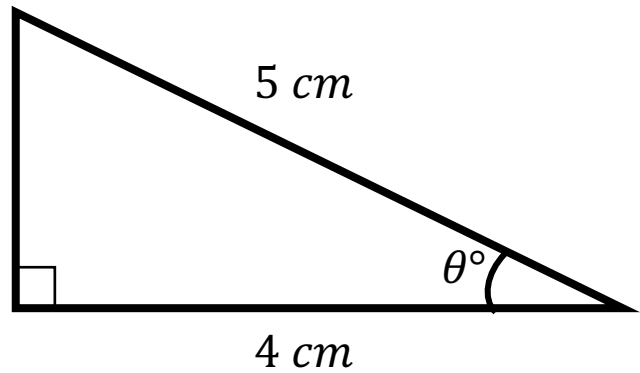
Your Turn

Calculate θ . Round your answer to 1 decimal place.



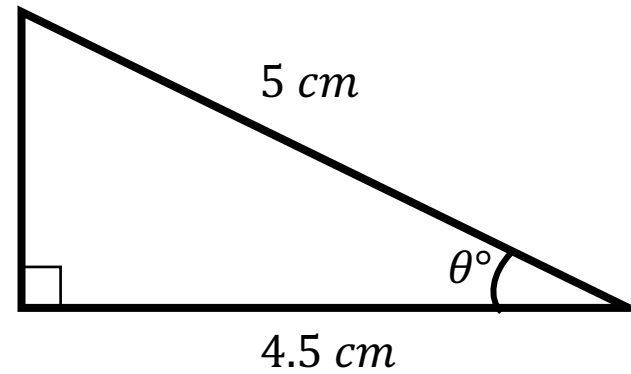
Worked Example

Calculate θ . Round your answer to 1 decimal place.



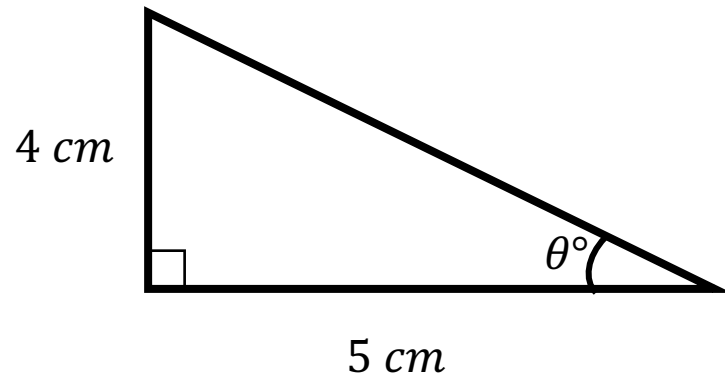
Your Turn

Calculate θ . Round your answer to 1 decimal place.



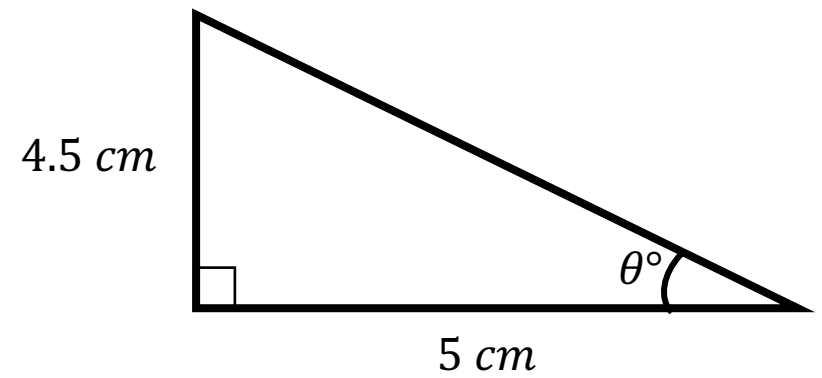
Worked Example

Calculate θ . Round your answer to 1 decimal place.



Your Turn

Calculate θ . Round your answer to 1 decimal place.

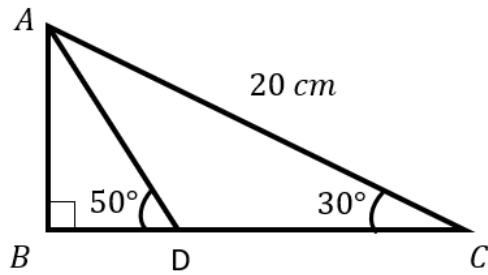


Fill in the Gaps

Labelled diagram	Choose ratio	Substitute into formula	Rearrange formula	Answer (1dp)
	cos	$\cos x = \frac{7}{12}$	$x = \cos^{-1}\left(\frac{7}{12}\right)$	
	sin			
		$\cos x = \frac{2}{3}$		
			$x = \tan^{-1}\left(\frac{15}{11}\right)$	

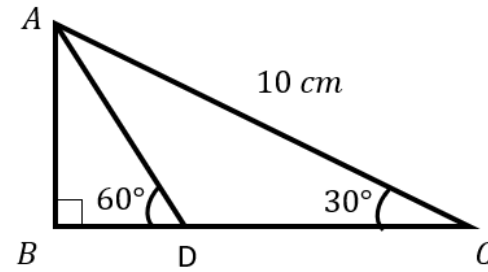
Worked Example

Calculate the length of BD :



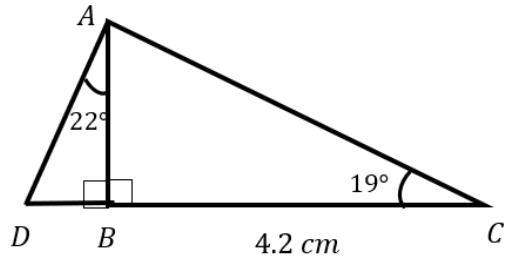
Your Turn

Calculate the length of BD :



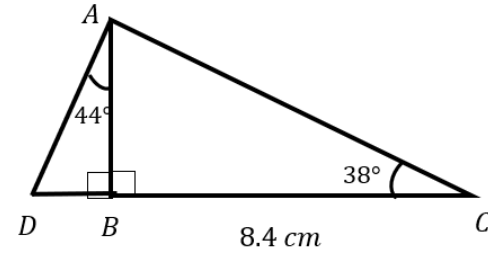
Worked Example

BC is 4.2 cm.
Calculate the length of AD :



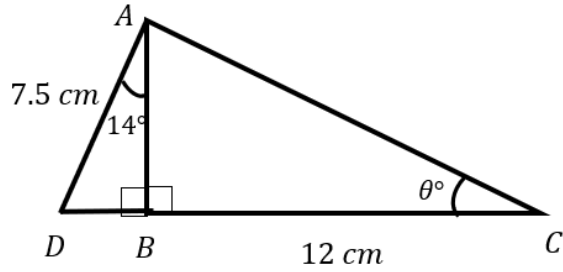
Your Turn

BC is 8.4 cm.
Calculate the length of AD :



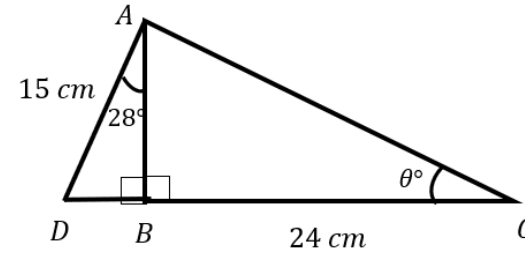
Worked Example

BC is 12 cm.
Calculate θ



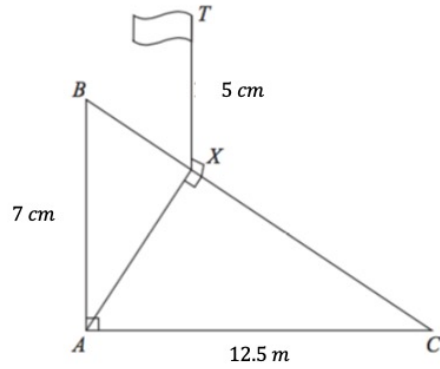
Your Turn

BC is 24 cm.
Calculate θ



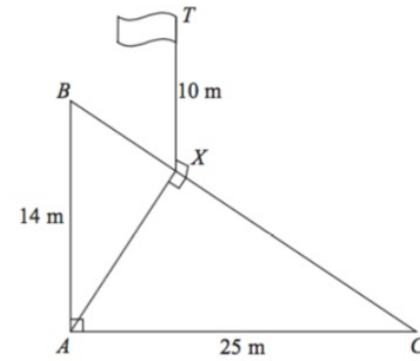
Worked Example

Calculate the angle of elevation of T from A :



Your Turn

Calculate the angle of elevation of T from A :



Worked Example

A tree is a horizontal distance of 5 m away from where you are standing. Using a clinometer, you measure the angle of elevation from the ground to the top of the tree. This angle is 30° . How tall is the tree?

Your Turn

A tree is a horizontal distance of 5 m away from where you are standing. Using a clinometer, you measure the angle of elevation from the ground to the top of the tree. This angle is 60° . How tall is the tree?

Extra Notes