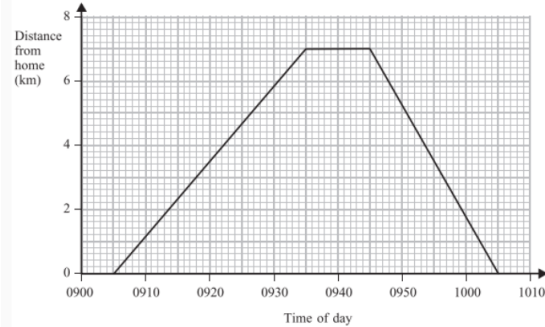


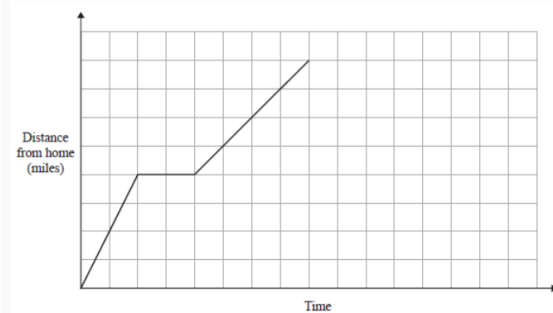
Securing grade 5 – Ratio and rates of change – Compound measures

Anil cycled from his home to the park.
Anil waited in the park.
Then he cycled back home.
Here is a distance-time graph for Anil's complete journey.



Work out Anil's average speed on his journey home.
Give your answer in kilometres per hour.

On Monday Ria delivered a parcel to a hospital.
The travel graph represents Ria's journey to the hospital.



Ria left home at 13 00
She drove for 30 minutes at a constant speed of 40 mph.
She then stopped for a break.

Ria then drove to the hospital at a constant speed.
She was at the hospital for 30 minutes.
She then drove home at a constant speed of 32 mph.

At what time does she arrive home?

Winnie drives 184 miles.
She drives 60 miles on ordinary roads and the rest on a motorway.

She completes the journey in $3\frac{1}{2}$ hours.
She drives at an average speed of 40mph on ordinary roads.

Work out her average speed on the motorway.

A gold bar has a mass of 12.5 kg.

The density of gold is 19.3 g/cm^3

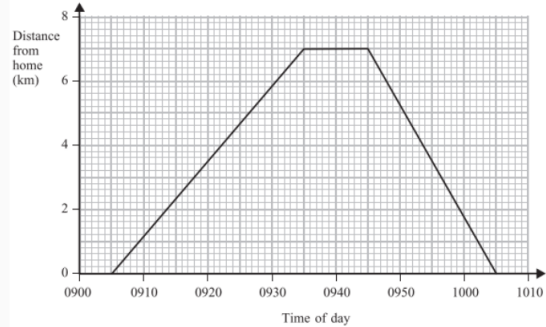
Work out the volume of the gold bar.
Give your answer correct to 3 significant figures.

A box exerts a pressure of 12 N/m^2 on an area of 1.5 m^2 .

Find the force creating this pressure.

Securing grade 5 – Ratio and rates of change – Compound measures

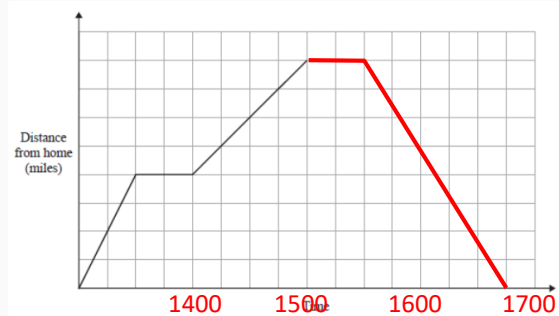
Anil cycled from his home to the park.
Anil waited in the park.
Then he cycled back home.
Here is a distance-time graph for Anil's complete journey.



Work out Anil's average speed on his journey home.
Give your answer in kilometres per hour.

21km/h

On Monday Ria delivered a parcel to a hospital.
The travel graph represents Ria's journey to the hospital.



Ria left home at 13 00
She drove for 30 minutes at a constant speed of 40 mph.
She then stopped for a break.

Ria then drove to the hospital at a constant speed.
She was at the hospital for 30 minutes.
She then drove home at a constant speed of 32 mph.

At what time does she arrive home?

16:45

Winnie drives 184 miles.
She drives 60 miles on ordinary roads and the rest on a motorway.

She completes the journey in $3\frac{1}{2}$ hours.
She drives at an average speed of 40mph on ordinary roads.

Work out her average speed on the motorway.

62mph

A gold bar has a mass of 12.5 kg.

The density of gold is 19.3 g/cm^3

Work out the volume of the gold bar.
Give your answer correct to 3 significant figures.

0.648cm³

A box exerts a pressure of 12 N/m^2 on an area of 1.5 m^2 .

Find the force creating this pressure.

18N

Securing grade 5 – Ratio and rates of change – Context

This is a list of ingredients for making a pear & almond crumble for 4 people.

Ingredients for 4 people.

80 g plain flour
60 g ground almonds
90 g soft brown sugar
60 g butter
4 ripe pears

Work out the amount of each ingredient needed to make a pear & almond crumble for 10 people.

Babajan makes breakfast cereal.
She mixes nuts, raisins and oats in the ratio 3 : 2 : 5 by weight.

On Tuesday, Babajan makes 300 grams of the breakfast cereal.

500 grams of nuts cost £8

Work out the cost of the nuts used to make 300 grams of the breakfast cereal.

The angles in a triangle are in the ratio 1 : 2 : 3.

Neil says

This is a right-angled triangle.

Is Neil correct?

You must show your working.

The ratio of the cost of one metre of cotton fabric to the cost of one metre of silk fabric is 2 : 5

Complete the table of costs.

	2 m	6 m	8 m	9 m
cotton fabric	£6	<input type="text"/>	<input type="text"/>	<input type="text"/>
silk fabric	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Kim, Laura and Molly share £385

The ratio of the amount of money Kim gets to the amount of money Molly gets is 2 : 5

Kim gets £105 less than Molly gets.

What percentage of the £385 does Laura get?

Securing grade 5 – Ratio and rates of change – Context

This is a list of ingredients for making a pear & almond crumble for 4 people.

Ingredients for 4 people.

80 g plain flour
60 g ground almonds
90 g soft brown sugar
60 g butter
4 ripe pears

Work out the amount of each ingredient needed to make a pear & almond crumble for 10 people.

200g flour
150g almonds
225g sugar
150g butte
10 pears

Babajan makes breakfast cereal.
She mixes nuts, raisins and oats in the ratio 3 : 2 : 5 by weight.

On Tuesday, Babajan makes 300 grams of the breakfast cereal.

500 grams of nuts cost £8

Work out the cost of the nuts used to make 300 grams of the breakfast cereal.

£1.44

The ratio of the cost of one metre of cotton fabric to the cost of one metre of silk fabric is 2 : 5

Complete the table of costs.

	2 m	6 m	8 m	9 m
cotton fabric	£6	<i>£18</i>	<i>£24</i>	<i>£27</i>
silk fabric	<i>£15</i>	<i>£45</i>	<i>£60</i>	<i>£67.50</i>

The angles in a triangle are in the ratio 1 : 2 : 3.

Neil says

This is a right-angled triangle.

Is Neil correct?

You must show your working.

$$\frac{180}{6} = 30$$

30:60:90

Yes it is right angled

Kim, Laura and Molly share £385

The ratio of the amount of money Kim gets to the amount of money Molly gets is 2 : 5

Kim gets £105 less than Molly gets.

What percentage of the £385 does Laura get?

$$\frac{140}{385} \times 100 = 36\%$$

Securing grade 5 – Ratio and rates of change – Percentages

Bill buys and sells laptops.

Last month Bill bought 50 laptops.
He paid £400 for each laptop.

He sold

40 of these laptops at a profit of 30% on each laptop
10 of these laptops at a profit of 15% on each laptop

Bill's target last month was to sell all 50 laptops for a total of at least £25 000

Did Bill reach this target?

Anya has £5000 to invest for 3 years.
She looks at these two accounts with their interest rates.

Southern Bank Saver

Annual interest rate:
Year 1: 2%
Year 2: 3%
Year 3: 4%

Northern Bank Fixed Rate

Fixed annual rate of 3.5%
compound interest

Which account will give her the better deal and by how much?

In a sale, the normal price of a book is reduced by 30%.
The sale price of the book is £2.80.

Work out the normal price of the book.

Matteus has a meal out.
The total bill is £34.65.
This includes a 12.5% service charge.

Calculate the cost of the meal without the service charge.

Securing grade 5 – Ratio and rates of change – Percentages

In September Sharon paid £565 for some books.
She sold all the books for a total of £780

In October Sharon bought and sold some more books.
The total profit she made in October was 13% greater than the total profit she made in September.

In November Sharon wants to pay a bill of £30
Sharon thinks that the 13% extra profit she made in October will be enough to pay this bill.

Is Sharon correct?

Fitness Classes cost £6 per person. The table shows the number of people who go to the classes on Thursday, Friday and Saturday.

Class	Number of people
Thursday	13
Friday	11
Saturday	16

The teacher earns 90% of the total paid. How much does the teacher earn altogether on these days?

The price of a car increases from £10 400 to £11 284.

Calculate the percentage increase.

This two-way table summarises some information about the membership of Sheldon Running Club.

	Age under 18	Age 18–59	Age 60+
Male	30	68	22
Female	14	46	20

What percentage of the whole membership is aged 18–59?

Emily buys a pack of 12 bottles of water.
The pack costs £5.64

Emily sells all 12 bottles for 50p each.
Work out Emily's percentage profit.

Give your answer correct to 1 decimal place.

Securing grade 5 – Ratio and rates of change – Percentages

Bill buys and sells laptops.

Last month Bill bought 50 laptops.
He paid £400 for each laptop.

He sold

40 of these laptops at a profit of 30% on each laptop
10 of these laptops at a profit of 15% on each laptop

Bill's target last month was to sell all 50 laptops for a total of at least £25 000

Did Bill reach this target?

*Yes he sold them for £25400
in total*

Anya has £5000 to invest for 3 years.
She looks at these two accounts with their interest rates.

Southern Bank Saver	Northern Bank Fixed Rate
Annual interest rate: Year 1: 2% Year 2: 3% Year 3: 4%	Fixed annual rate of 3.5% compound interest

Which account will give her the better deal and by how much?

*Southern bank:
£5463.12*

*Northern Bank
£5543.59*

*Northern bank will give the
better deal by £80.47*

In a sale, the normal price of a book is reduced by 30%.
The sale price of the book is £2.80.

Work out the normal price of the book.

£4

Matteus has a meal out.
The total bill is £34.65.
This includes a 12.5% service charge.

Calculate the cost of the meal without the service charge.

£30.80

Securing grade 5 – Ratio and rates of change – Percentages

In September Sharon paid £565 for some books.
She sold all the books for a total of £780

In October Sharon bought and sold some more books.
The total profit she made in October was 13% greater than the total profit she made in September.

In November Sharon wants to pay a bill of £30
Sharon thinks that the 13% extra profit she made in October will be enough to pay this bill.

Is Sharon correct?

No as she only has an additional £27.95

Fitness Classes cost £6 per person. The table shows the number of people who go to the classes on Thursday, Friday and Saturday.

Class	Number of people
Thursday	13
Friday	11
Saturday	16

The teacher earns 90% of the total paid. How much does the teacher earn altogether on these days?

£216

The price of a car increases from £10 400 to £11 284.

Calculate the percentage increase.

8.5%

This two-way table summarises some information about the membership of Sheldon Running Club.

	Age under 18	Age 18–59	Age 60+
Male	30	68	22
Female	14	46	20

What percentage of the whole membership is aged 18–59?

57%

Emily buys a pack of 12 bottles of water.
The pack costs £5.64

Emily sells all 12 bottles for 50p each.
Work out Emily's percentage profit.

Give your answer correct to 1 decimal place.

6.4%