GCSE Target Work

AQA Exam Questions
3rd Half Term Targets

Name:

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Source	Target	Completion (Y/N)
EOTA 3	Proportion	
EOTA 3	Percentage Change and Reverse Percentage	
EOTA 3	Rearranging Formula and Forming an Expression	
EOTA 3	Compound Units	
EOTA 3	Charts and Graphs	
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QR Codes

Proportion		Rearranging formula and forming an expression
Compound Units	Bar Charts	Pie Charts
Scatter Graphs	Straight Line Graphs	Loci and Construction
Transformation	Paper 1 November 2022	Paper 3 November 2023

Perimeter, area and volume

Where a and b are the lengths of the parallel sides and h is their perpendicular separation:

$$\text{Area of a trapezium} = \frac{1}{2}(a+b)h$$

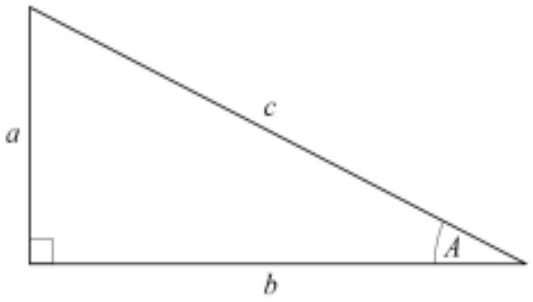
Volume of a prism = area of cross section × length

Where r is the radius and d is the diameter:

$$\text{Circumference of a circle} = 2\pi r = \pi d$$

$$\text{Area of a circle} = \pi r^2$$

Pythagoras' Theorem and Trigonometry



In any right-angled triangle where a, b and c are the length of the sides and c is the hypotenuse:

$$a^2 + b^2 = c^2$$

In any right-angled triangle ABC where a, b and c are the length of the sides and c is the hypotenuse:

$$\sin A = \frac{a}{c} \qquad \cos A = \frac{b}{c} \qquad \tan A = \frac{a}{b}$$

Compound Interest

Where P is the principal amount, r is the interest rate over a given period and n is number of times that the interest is compounded:

$$\text{Total accrued} = P\left(1 + \frac{r}{100}\right)^n$$

Probability

Where $\mathrm{P}(A)$ is the probability of outcome A and $\mathrm{P}(B)$ is the probability of outcome B:

$$\mathrm{P}(A \text{ or } B) = \mathrm{P}(A) + \mathrm{P}(B) - \mathrm{P}(A \text{ and } B)$$

Proportion

Q1.

	Cost of 100 grams
Cereal	49p
Pasta	14p

Leah buys 400 grams of cereal and 250 grams of pasta.

Work out the **total** cost in £

Answer £ _____

(Total 4 marks)

Q2.

Steve and Molly each buy 480 tea bags.

Small packs	Large packs
80 tea bags for £1.90	160 tea bags for £3.25

Steve buys only small packs.
Molly buys only large packs.

In total, how much **more** than Molly does Steve pay?

Answer £ _____

(Total 4 marks)

Q3.

A house is being built.
8400 bricks will be laid.

Three bricklayers will each
lay 350 bricks per day
be paid £175 per day.

How much **in total** will they be paid?

Answer £ _____

(Total 3 marks)

Q4.

Jane is painting her garden fence whose area is 46 m^2.

A tin contains half a litre of paint.

The instructions say 1 litre of paint will cover 12 m^2.

(a) How many tins does Jane need to buy?

Answer _____

(3)

(b) In fact, Jane is only able to cover 10 m^2 per litre of paint.

What is the least number of extra tins that Jane needs to buy?

Answer _____

(2)

(Total 5 marks)

Q5.

6 cakes cost £10.74

Work out the cost of 11 of these cakes.

Answer £ _____

(Total 2 marks)

Q6.

Boxes of chocolates each contain 25 chocolates.

One box costs £3.25

A shop has a special offer.

Two boxes for £5

How much cheaper **per chocolate** is the special offer?

Answer _____ pence

(Total 3 marks)

Q7.

A machine takes 4 seconds to fill a packet of crisps.

(a) In total, how many packets can 35 of these machines fill in 8 hours?

Answer _____

(4)

(b) Each packet of crisps contains 32.5 grams of crisps.

At what rate does a machine put the crisps into the packets?
Give your answer in grams per second.

Answer _____ grams per second

(2)

(Total 6 marks)

Q8.

Mortar is made by mixing cement and sand as shown.

For every 1 kg of cement used, add 4 kg of sand

Cement costs £0.19 per kg
Sand costs £0.07 per kg

Tomasz uses 150 kg of cement to make some mortar.

Work out the total cost of the mortar.

Answer £ _____

(Total 3 marks)

Q9.

Kim buys pet food in 1.5 kg packs.

Her pet needs 0.8 kg of food each week.

She wants to have enough food for the next 14 weeks.

She already has two 1.5 kg packs.

Work out the smallest number of packs she needs to buy.

You **must** show your working.

Answer _____

(Total 4 marks)

Percentage Change

Q1.

Work out the percentage increase from 80 to 280

Answer = _____ %

(Total 3 marks)

Q2.

In 1981 the population of England was 46 million.
In 2011 the population of England was 53 million.

Work out the increase in population as a percentage of the 1981 figure.

Answer _____ %

(Total 3 marks)

Q3.

The cash price for a boiler is £2000
Customers can pay the cash price or pay monthly.

Cash Price	Pay Monthly
£2000	60 monthly payments of £40

Work out the percentage increase from the cash price when paying monthly.

Answer _____ %

(Total 4 marks)

Q4.

50% of a number is 40

Circle the number.

20 80 800 2000

(Total 1 mark)

Q5.

The cost of a ticket increases by 10% to £19.25

Work out the original cost.

Answer £_____

(Total 3 marks)

Q6.

Three friends arrive at a party.

Their arrival increases the number of people at the party by 20%

In total, how many people are now at the party?

Answer _____

(Total 2 marks)

Rearranging Formula

Q1.

Rearrange $m = p - 5$ to make p the subject.

Circle your answer.

$p = \frac{m}{5}$ $\quad$ $p = m + 5$ $\quad$ $p = 5m$ $\quad$ $p = m - 5$

(Total 1 mark)

Q2.

To travel to a festival, a group of people will hire a minibus.

This formula has all costs in £

$$\text{Cost per person} = \frac{165 + \text{cost of the minibus}}{\text{number of people in the group}}$$

(a) With 12 people in the group, the cost of the minibus will be £567

Work out the cost per person.

Answer £ _____

(2)

(b) With 15 people in the group, they will hire a different minibus.
The cost per person will be £50

Work out the cost of this minibus.

Answer £ _____

(3)

(Total 5 marks)

Q3.

This formula works out the tax you pay on what you earn.

$$T = 0.2(E - 12570)$$

T is the tax you pay in pounds.

E is the amount you earn in pounds.

(a) How much tax do you pay if you earn £24 000?

Answer £ _____

(2)

(b) What is the most you can earn without paying tax?

Answer £ _____

(1)

(c) Alison pays £6300 tax.

Work out the amount she earns.

Answer £ _____

(3)

(Total 6 marks)

Q4.

Rearrange $p = r + 3$ to make r the subject.

r = _____

(Total 1 mark)

Q5.

Bobbi has these notes.

Note	Number of notes
£5	3
£10	x

The total value of her notes is £T

Write a formula for T in terms of x.

_____

_____

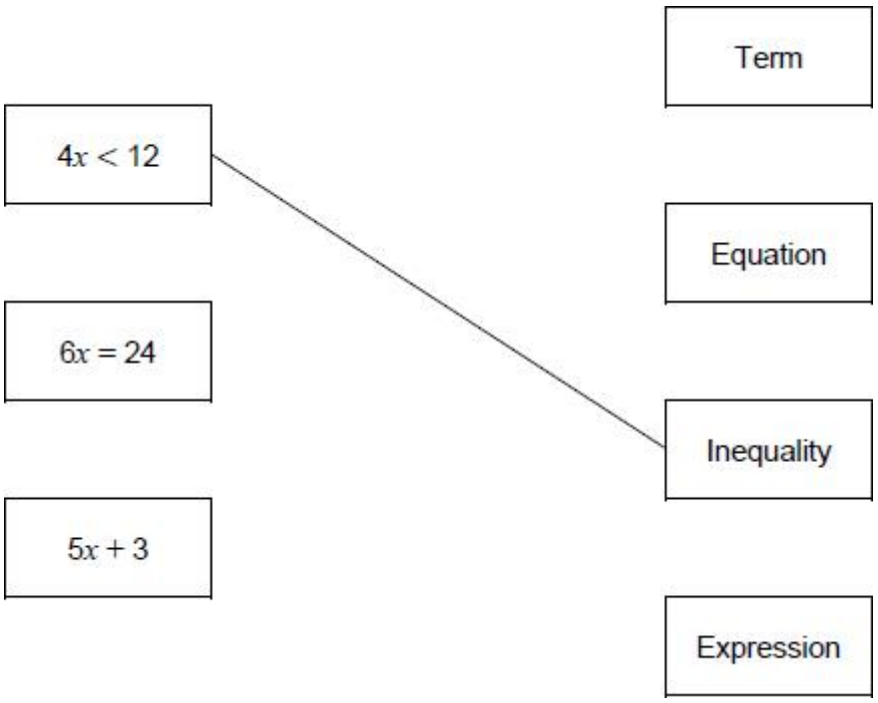
Answer _____

(Total 2 marks)

Q6.

Match the algebra to the correct description.

One has been done for you.



(Total 2 marks)

Q7.

d is 6 more than c.

Circle the correct equation.

$d = 6c$ $\quad$ $c = 6d$ $\quad$ $d = c + 6$ $\quad$ $c = d + 6$

(Total 1 mark)

Compound Units

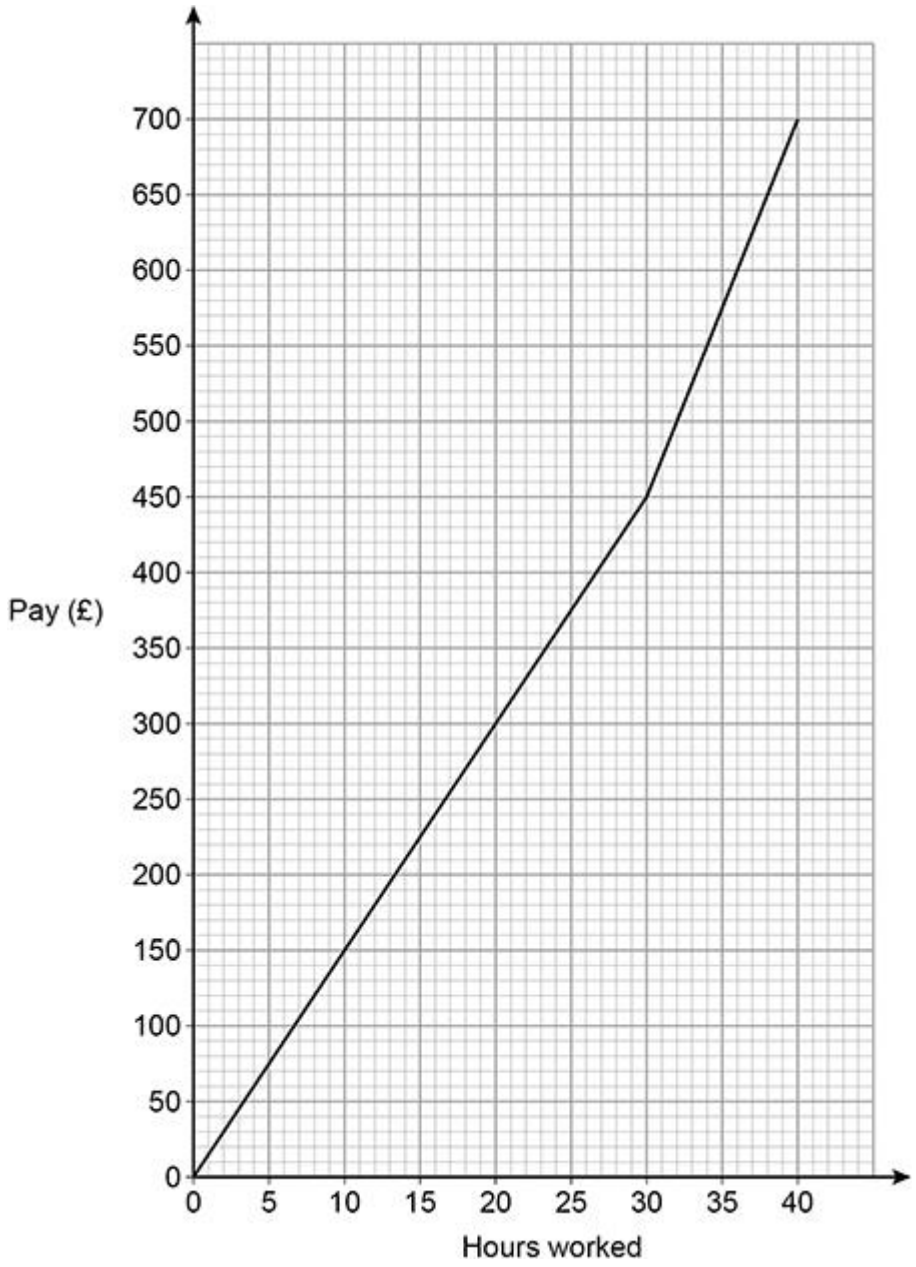
Q1.

In a week, Samir is paid

a basic hourly rate for the first 30 hours worked

an overtime hourly rate for any extra hours worked.

The graph shows his pay for working up to 40 hours in a week.



Work out the ratio basic hourly rate : overtime hourly rate

Give your answer in its simplest form.

Answer _____ : _____

(Total 3 marks)

Q2.

A, *B*, *C* and *D* are junctions on a motorway.

Not drawn accurately

distance *CD* = 3 × distance *AB*

distance *BC* = 25 miles

Salma drives from *A* to *C*.

She drives for 30 minutes at an average speed of 62 miles per hour.

Work out the distance *AD*.

Answer _____ miles

(Total 4 marks)

Q3.

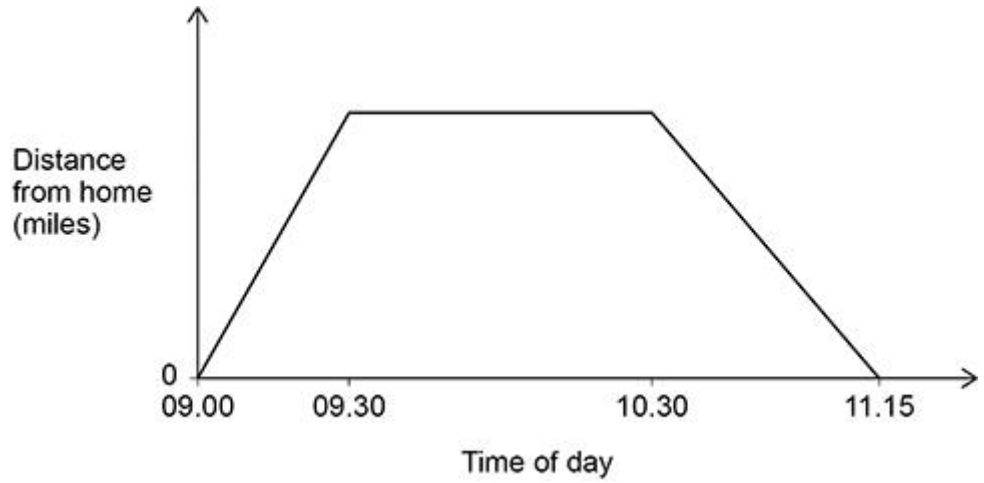
Chris visits a library.

He cycles to the library in half an hour at a speed of 12 miles per hour.

He stays at the library for one hour.

He then cycles home.

The sketch graph represents his visit.



Work out the speed, in miles per hour, at which Chris cycles home.

_____

_____

_____

_____

Answer _____ mph

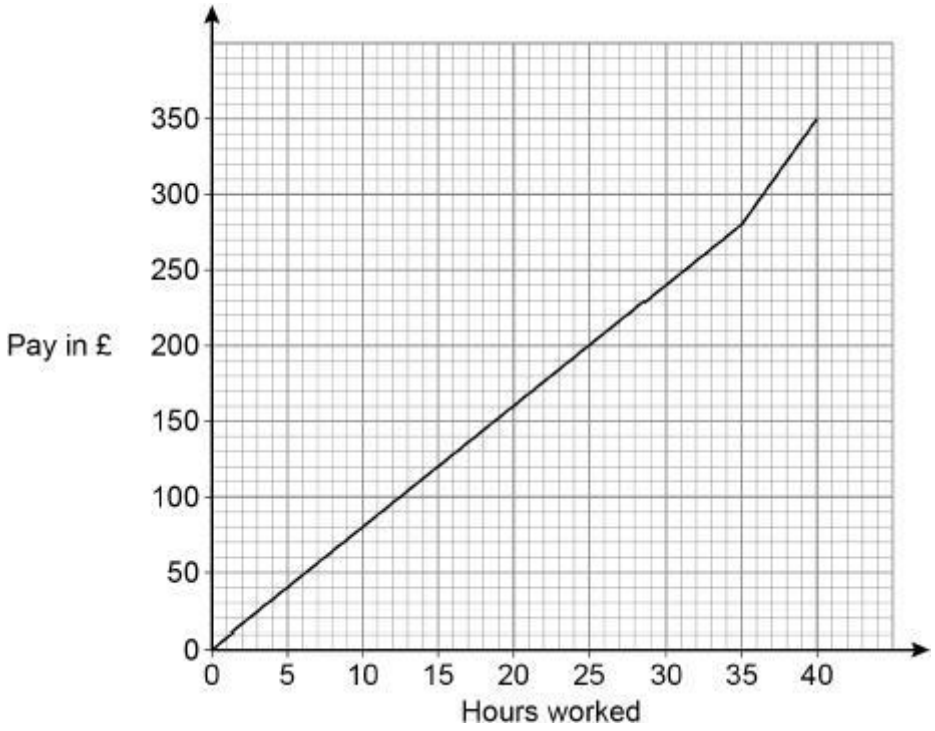
(Total 3 marks)

Q4.

The graph shows how much Molly is paid for working for up to 40 hours.

She receives

a basic rate of pay for the first 35 hours worked
a higher rate of pay for the next 5 hours worked.



Work out the difference between the higher rate of pay and the basic rate of pay.

Give your answer in £ per hour.

_____

_____

_____

_____

Answer £ _____ per hour

(Total 3 marks)

Q5.

Two trains, *A* and *B*, travel from Derby to York.

Both trains travel at a constant speed.

Here is the timetable for the trains.

	Train *A*	Train *B*
Leave Derby	0900	1030
Arrive York	1100	1200

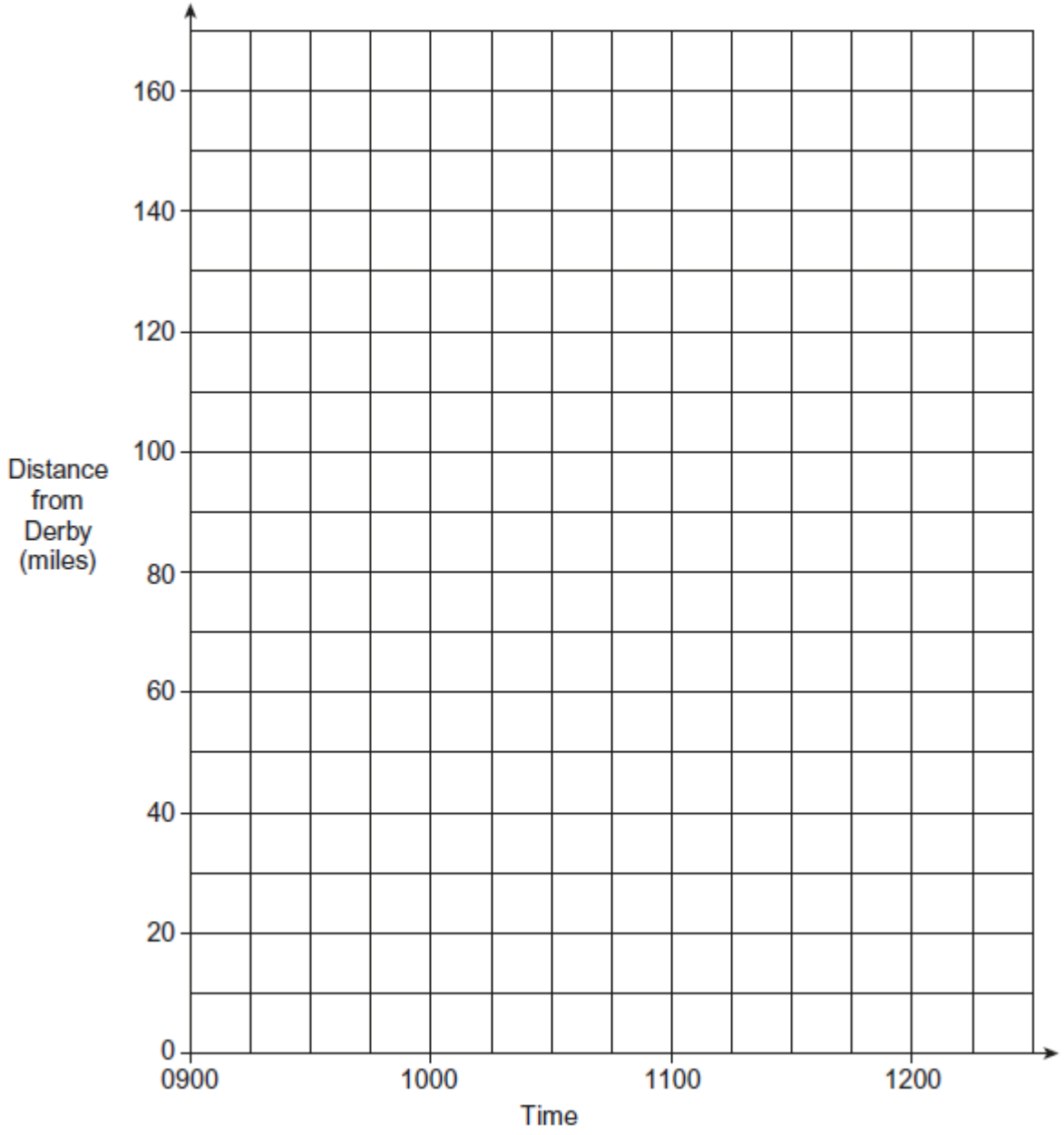
(a) Train *A* travels at 60 mph

On the grid below, draw the distance-time graph for Train *A*.

(1)

(b) On the grid below, draw the distance-time graph for Train *B*.

(1)



(c) Use your graph to work out the speed of Train *B*.

Answer _____ mph

(1)

(Total 3 marks)

Q6.

In this question, assume that the car uses the same amount of petrol for each mile it travels.

(a) A car uses 55 litres of petrol to travel 495 miles.

How far would the car travel on 80 litres of petrol?

_____

_____

_____

Answer _____ miles

(3)

(b) How much petrol would the car use on a trip of 160 miles?
Give your answer to the nearest litre.

_____

_____

_____

Answer _____ litres

(4)

(Total 7 marks)

Q7.

(a) Three electric cars are tested by driving them around a track until the battery runs out.
The table shows some information about their performance.

Car	Total time travelled (hours)	Average speed (km/h)	Total distance travelled (km)
A	4	35	
B		40	180
C	3		150

Complete the table.

(3)

(b) Two cars are driven around a 10 kilometre track.
Both cars leave from the start line at the same time.

Car X travels at exactly 40 km/h
Car Y travels at exactly 30 km/h

How many minutes will it be before they pass the start line together again?

_____

_____

_____

_____

_____

_____

Answer _____ minutes

(2)

(Total 5 marks)

Q8.

A solid has volume 300 cm^3 and density 2 g/cm^3

Circle the mass of the solid.

150 g 298 g 302 g 600 g

(Total 1 mark)

Q9.

A solid piece of silver has

mass 2.625 kilograms

volume 250 cm^3

Work out the density of the piece of silver.

Give your answer in grams per cubic centimetre.

_____

_____

_____

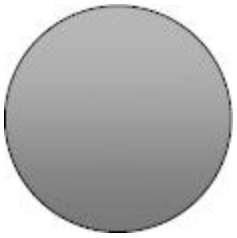
Answer _____ g/cm^3

(Total 2 marks)

Q10.

Volume of a sphere = $\frac{4}{3}\pi r^3$

A steel sphere, radius 3 cm, is shown.



(a) Work out the volume of the sphere.

_____

_____

Answer _____ cm^3

(2)

(b) The density of the steel is 5.2 grams/cm^3

Work out the mass of the sphere.

_____

_____

Answer _____ grams

(2)

(Total 4 marks)

Q11.

A solid statue has volume 512 cm^3

The statue has mass 3.6 kilograms.

density of iron = 7.87 grams per cubic centimetre

Is the statue made of iron?

You **must** show your working.

_____

_____

_____

_____

_____

_____

_____

_____

_____

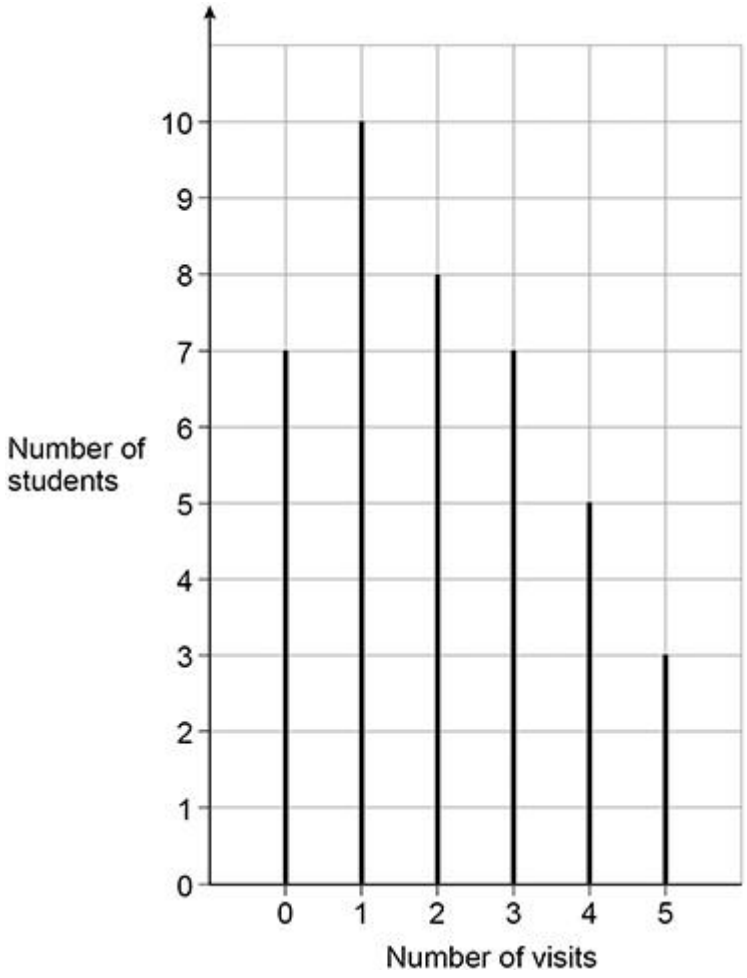
(Total 3 marks)

Charts and Graphs

Q1.

40 students were asked the number of visits they made to a gym one week.

The chart shows information about the results.



(a) Write down the modal number of visits.

Answer _____

(1)

(b) Work out the mean number of visits.

Give your answer as a decimal.

_____

_____

_____

_____

_____

Answer _____

(3)

(c) One of the 40 students is chosen at random.

Work out the probability that the student visited the gym **at least** once.

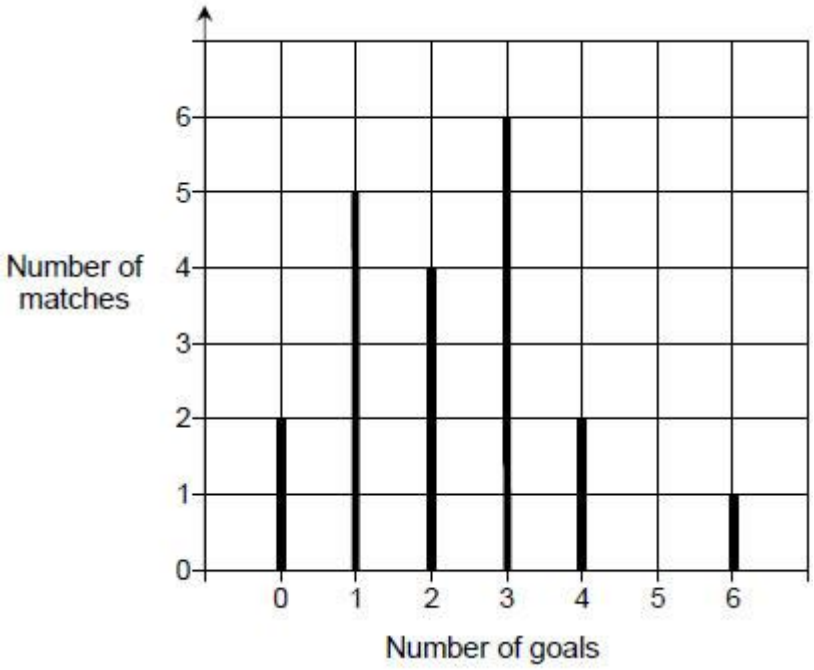
Answer _____

(2)

(Total 6 marks)

Q2.

The line graph shows the number of goals scored by a hockey team.



(a) Which number of goals is the mode?

Answer _____

(1)

(b) How many matches did the hockey team play altogether?

_____

_____

_____

Answer _____

(2)

(c) In one of the matches, this team won by 5 goals.

What was the score in that match?

Answer _____

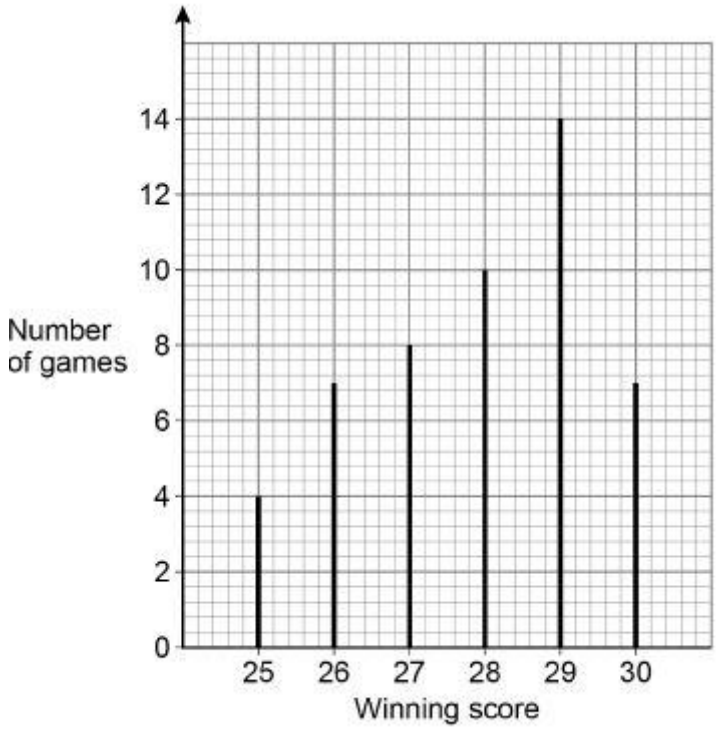
(1)

(Total 4 marks)

Q3.

A game is played 50 times.

The vertical line chart shows the winning scores.



(a) Write down the mode.

Answer _____

(1)

The game is played again.

(b) Use the chart to estimate the probability that the winning score is 25.

Answer _____

(1)

(c) Use the chart to estimate the probability that the winning score is 27 or more.

_____

_____

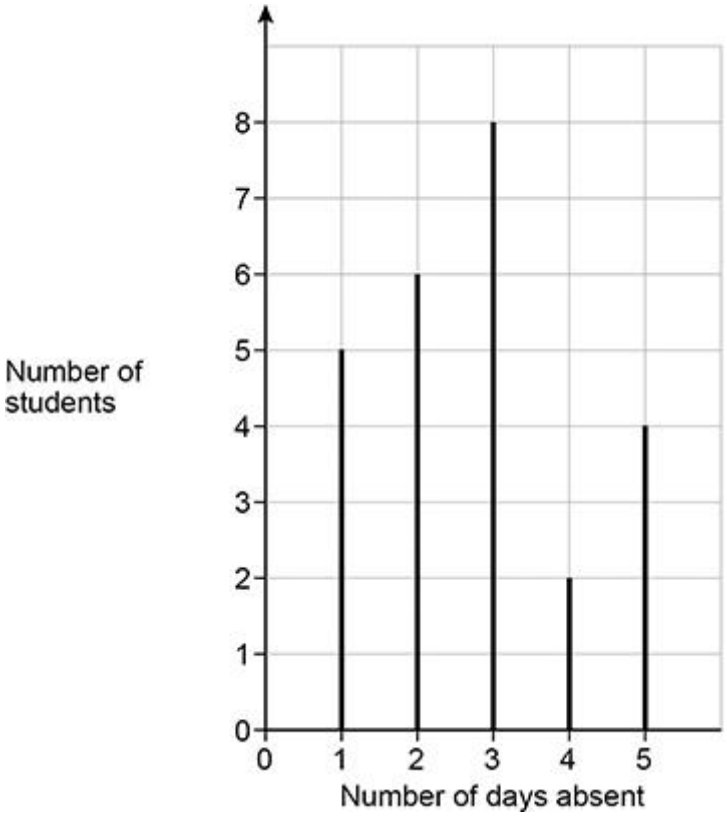
Answer _____ **(2)**

(Total 4 marks)

Q4.

A record was kept of the number of days that 25 students were absent one term.

The chart represents the results.



(a) Work out the mean number of days absent.

Answer _____

(3)

(b) One of the students is chosen at random.

Work out the probability that the student was absent for **less than** 4 days.

_____

_____

_____

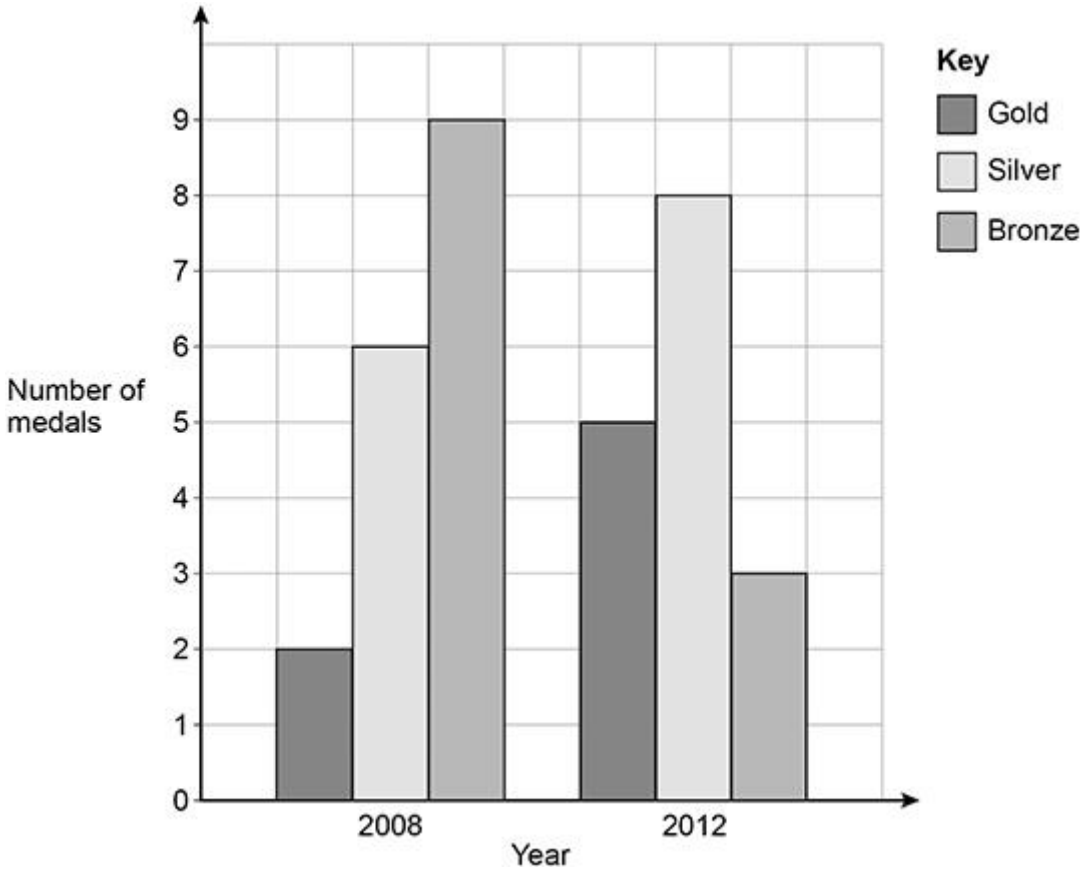
Answer _____

(2)

(Total 5 marks)

Q5.

The bar chart shows the number of medals won by a country at events in 2008 and 2012



(a) Complete this statement about the medals won by the country in 2008

number of Silver medals = _____ × number of Gold medals

(1)

(b) Show that the country won **more** medals in 2008 than in 2012

(2)

(c) At the 2016 event the country won an **equal** number of each type of medal.
Here is a statement about the medals won by the country in 2016

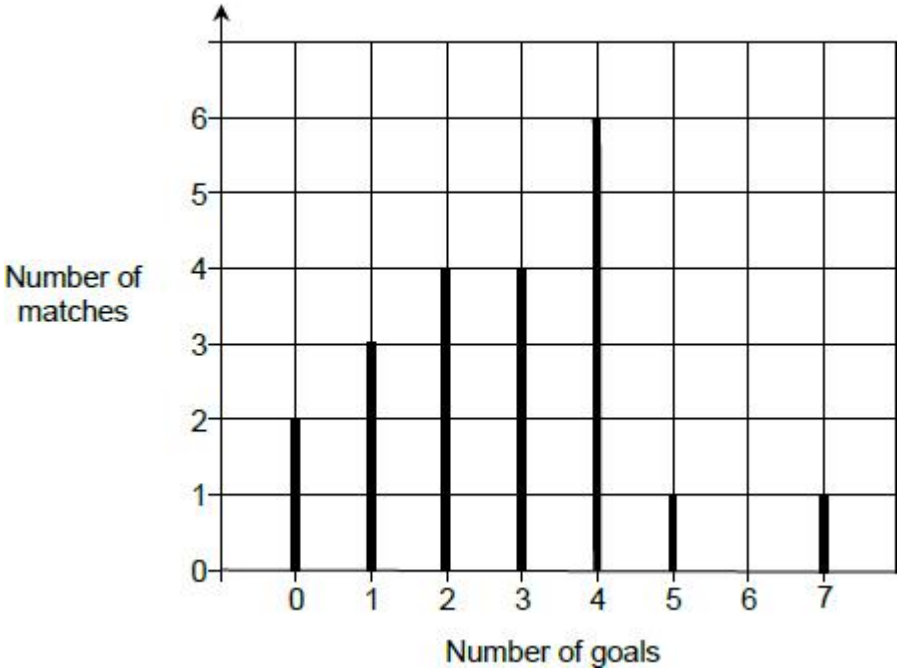
The total number of medals **cannot** be 25

Give a reason why the statement is correct.

(1)
(Total 4 marks)

Q6.

The line graph shows the number of goals scored by a hockey team.



(a) What is the mode of the number of goals?

Answer _____

(1)

(b) How many matches did the hockey team play altogether?

_____

_____

_____

Answer _____

(2)

(c) In one of the matches, this team won by 6 goals.
What was the score in that match?

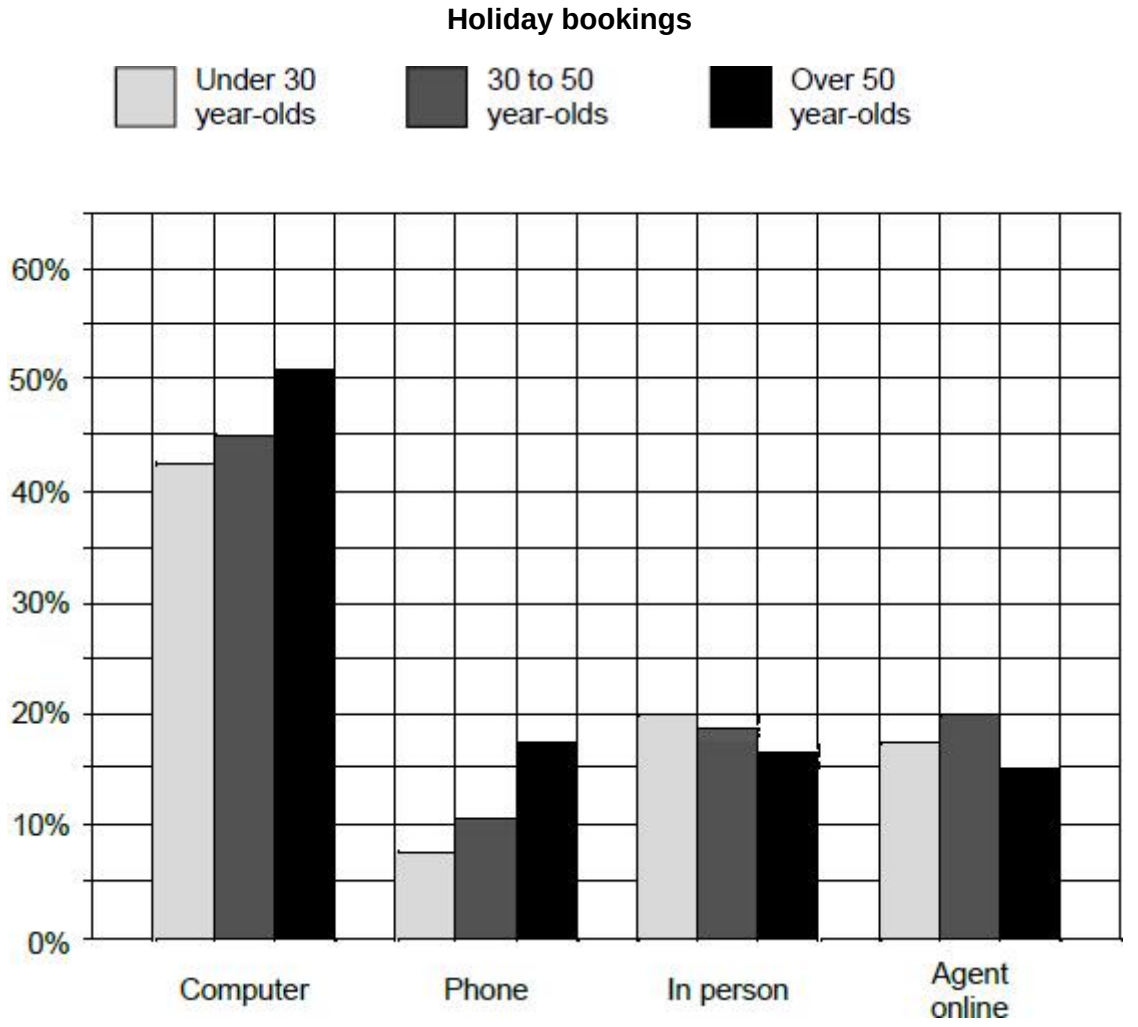
Answer _____

(1)

(Total 4 marks)

Q7.

The bar chart shows information about how holiday bookings are made.



(a) Which **two** ways of booking are most popular for under 30 year-olds?

Answer _____ and _____

(2)

(b) In total, what percentage of 30 to 50 year-olds booked in person or with an agent online?
Give your answer to the nearest 10%

_____

_____

Answer _____ %

(2)

(c) Make **two** comparisons of the data for 30 to 50 year-olds with 50 year-olds and over.

Comparison 1 _____

_____

_____

Comparison 2 _____

_____

_____

(2)

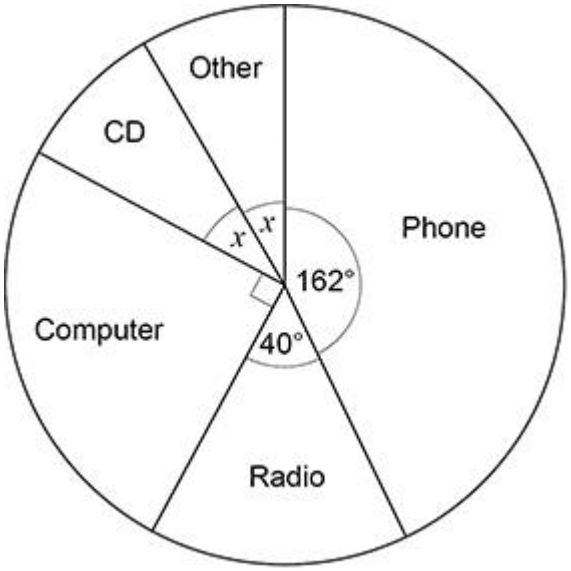
(Total 6 marks)

Pie Charts

Q1.

Some people were asked for the main way they listen to music.

A pie chart is drawn to represent their answers.



Not drawn accurately

(a) Work out the size of angle x.

_____

_____

_____

Answer _____ degrees

(2)

(b) 135 people said Computer.

How many people said Phone?

_____

_____

_____

_____

_____

Answer _____

(3)

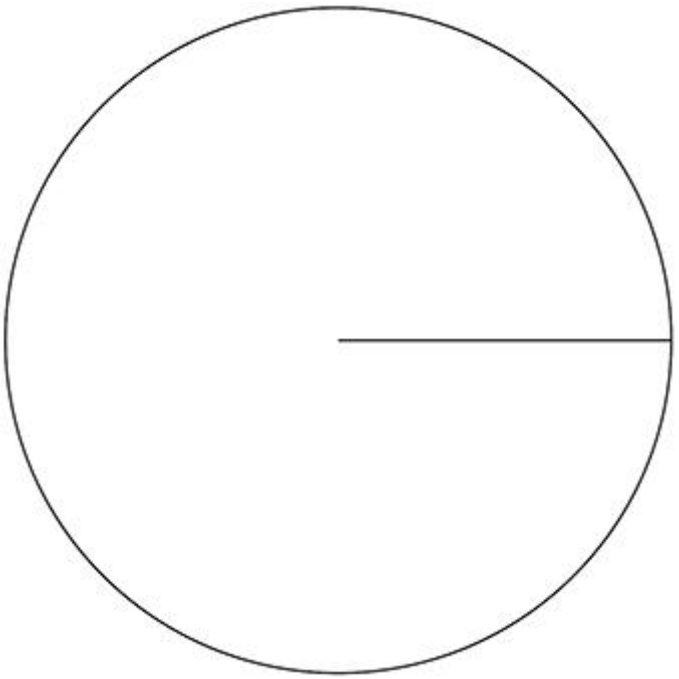
(Total 5 marks)

Q2.

60 people were asked if they would vote in an election.

- $\frac{1}{4}$ of the people said No
- 20 people said Yes
- The rest said Maybe

Draw and label a pie chart to show this information.



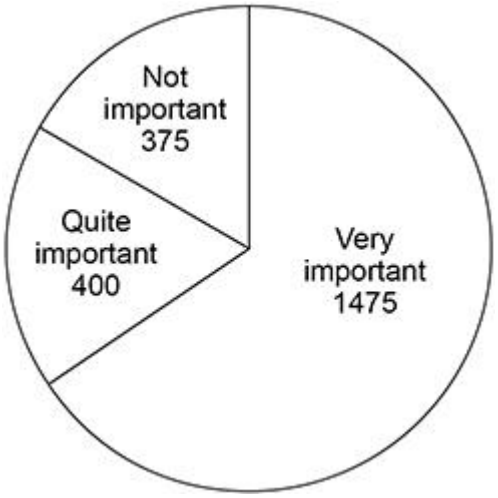
(Total 3 marks)

Q3.

A survey was held in a football stadium.

A sample of the crowd was asked about the importance of a family area.

The pie chart represents the answers.



(a) The total number of people in the crowd was 29 250

Estimate how many people in the crowd think that a family area is **very important**.
Assume that the sample is representative of the crowd.

_____

_____

_____

_____

_____

Answer _____

(3)

(b) In fact,

50% of the **sample** were sitting in the family area

10% of the **crowd** were sitting in the family area.

What is this likely to mean about the actual number of people in the crowd who think that a family area is very important?

Tick **one** box.

☐ It is larger than the answer to part (a)

☐ It is the same as the answer to part (a)

☐ It is lower than the answer to part (a)

(1)

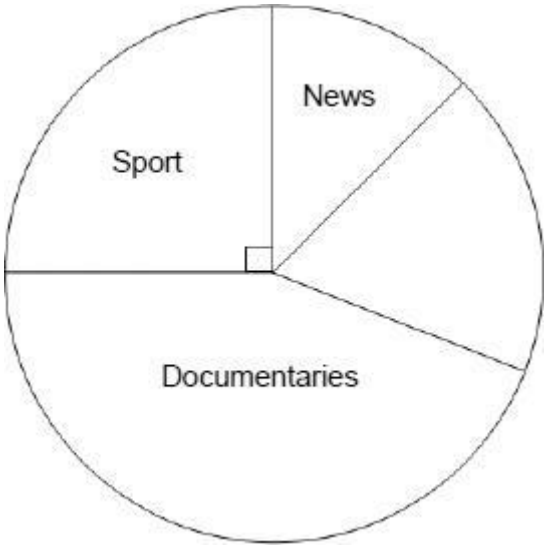
(Total 4 marks)

Q4.

Ronnie draws a pie chart to represent the amount of time he spent watching TV in December.

Altogether, he watched 90 hours of TV.

Time watching TV



(a) How many hours did he spend watching sport?

_____

_____

Answer _____ hours

(2)

(b) Write down **one** way in which his pie chart could be improved?

_____

_____

_____

(1)

(c) In January he also watched 90 hours of TV.
He watched 50 hours of documentaries.

Ronnie says,

> "This was more than in December because the pie chart showed I watched less than 45 hours of documentaries."

Comment on his claim.

_____

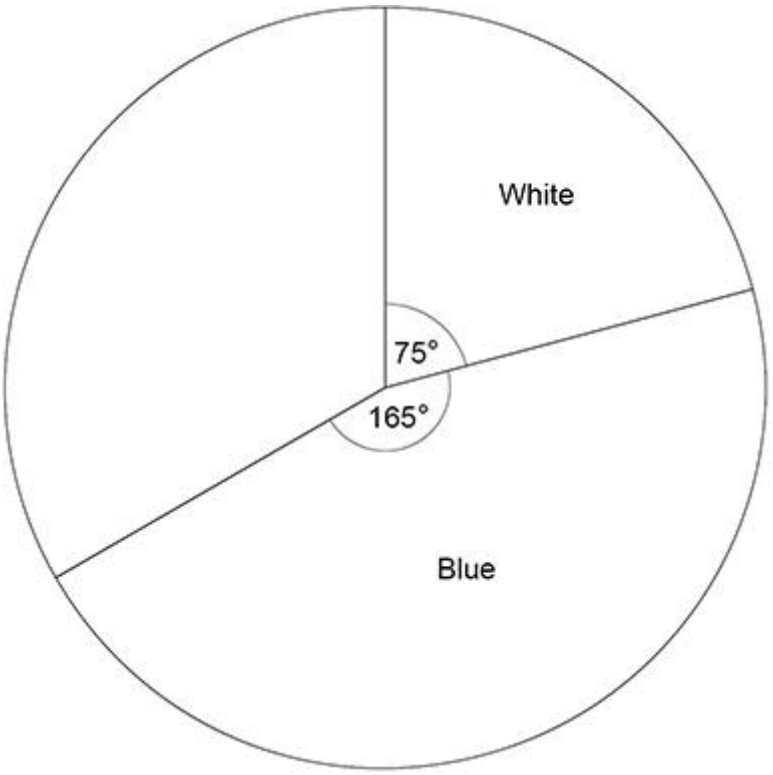
_____

(Total 4 marks)

Q5.

Some players were asked the shirt colour of their football team.
Each answer was either White, Blue, Red or Green.

A pie chart is drawn to represent the answers.
Two of the sectors are shown.



(a) The number who answered Red is three times the number who answered Green.

Complete the pie chart.

_____

_____

_____

_____

_____

(3)

(b) There were 600 players altogether.

How many players answered White?

_____

_____

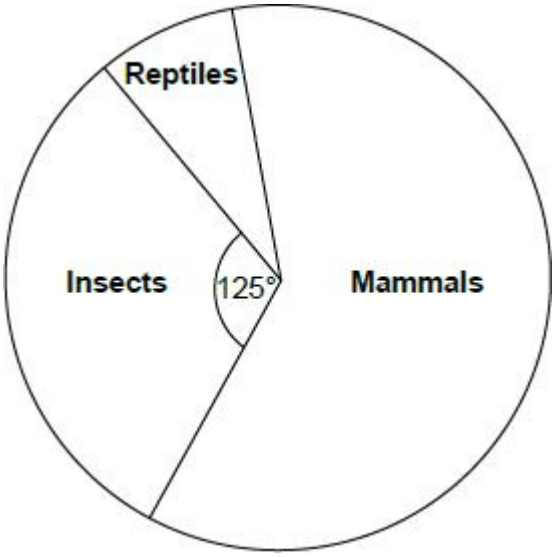
_____

Answer _____ **(Total 5 marks)**

Q6.

The pie chart shows some information about the proportion of animals in a zoo.

Zoo animals



Not drawn accurately

The angle for mammals is 175° more than the angle for reptiles.
There are 4680 animals in total.

Work out the number of mammals in the zoo.

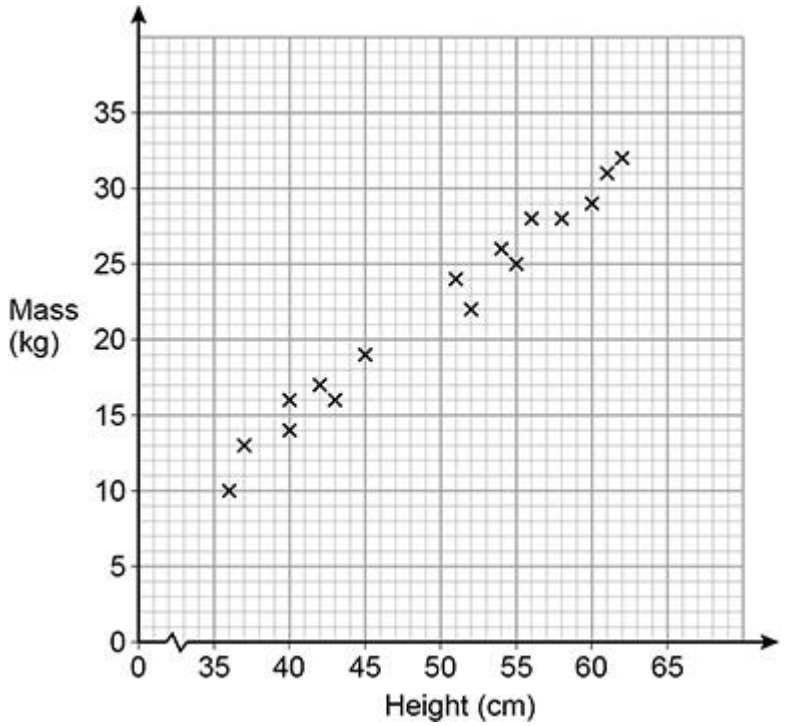
Answer _____

(Total 4 marks)

Scatter Graphs

Q1.

The scatter graph shows the height and mass of some dogs.



(a) The scatter graph shows positive correlation.

Describe the relationship between the height and mass of the dogs.

_____

_____

_____

(1)

(b) Use a line of best fit to estimate the mass of a dog with height 48 cm

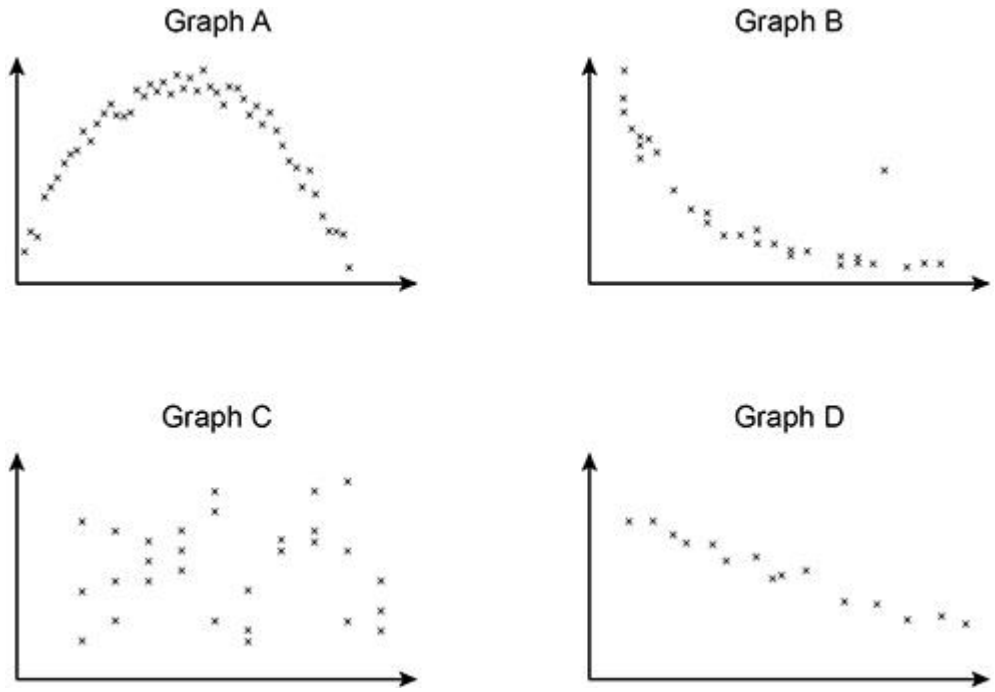
Answer _____ kg

(2)

(Total 3 marks)

Q2.

Here are four scatter graphs.



For which graph is a straight line of best fit appropriate?

Circle your answer.

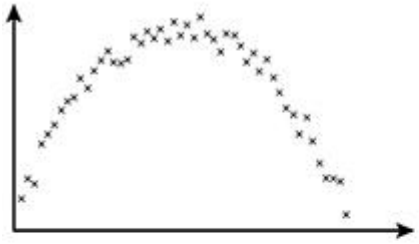
A B C D

(Total 1 mark)

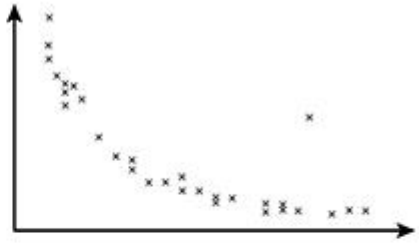
Q3.

Here are four scatter graphs.

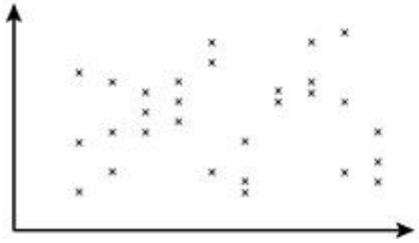
Graph A



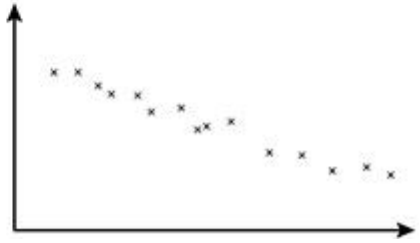
Graph B



Graph C



Graph D



Which graph has **one** outlier?

Circle your answer.

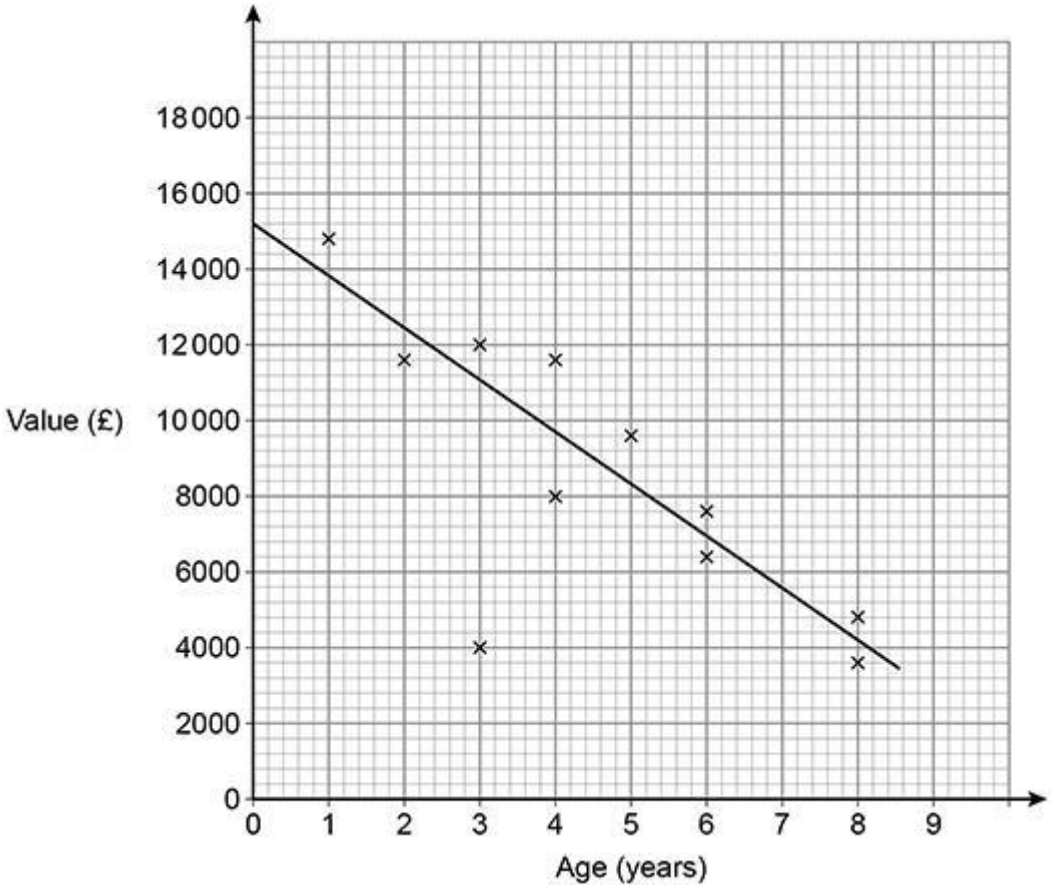
A B C D

(Total 1 mark)

Q4.

The scatter diagram shows the age and value of some cars in 2019

All the cars were of the same make and model.



(a) What type of correlation does the scatter graph show?

Answer _____

(1)

(b) Write down the value of the car that was an outlier.

_____

Answer £ _____

(1)

(c) Use the graph to estimate the value of a new car of this make and model in 2019

Answer £ _____

(1)

(d) A car of this make and model had a value of £5600 in 2019

Use the graph to estimate the year in which it was made.

_____

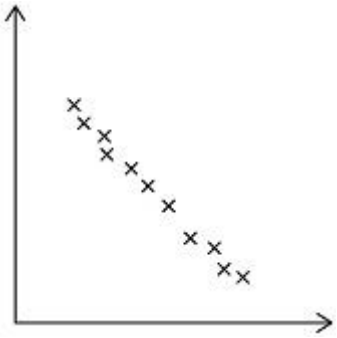
Answer _____

(2) (Total 5 marks)

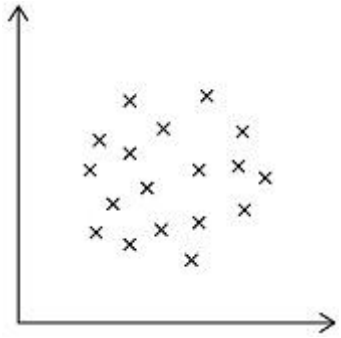
Q5.

A and B are scatter graphs.

Graph A



Graph B



What type of correlation is shown by each graph?

Choose from

Weak positive
Strong positive
Weak negative
Strong negative
No correlation

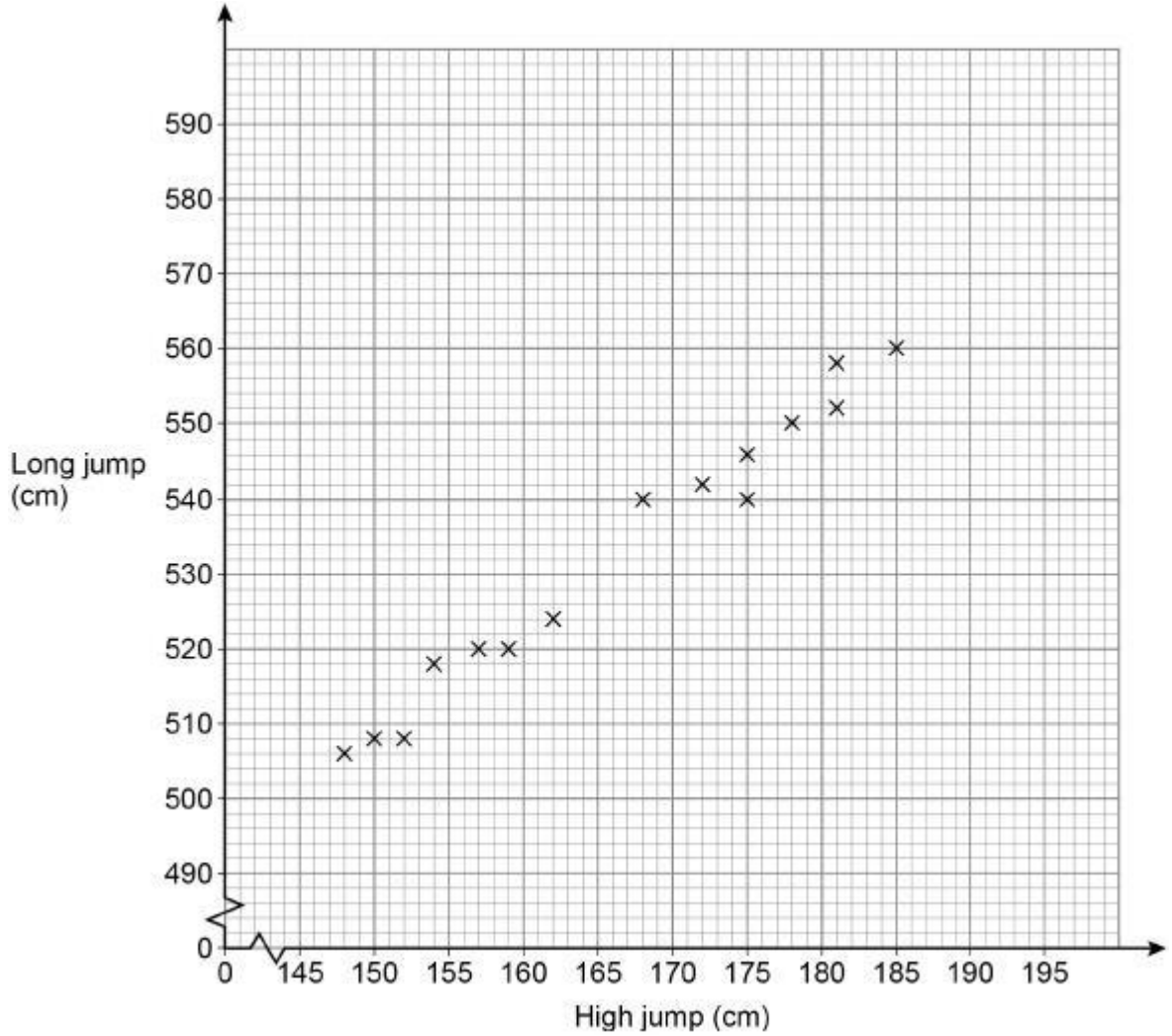
Graph A _____

Graph B _____

(Total 2 marks)

Q6.

The scatter graph shows the best high jump and the best long jump for 15 boys.



(a) Write down the type of correlation shown.

Answer _____

(1)

(b) Liam has a best high jump of 166 cm

Use a line of best fit to estimate his best long jump.

Answer _____ cm

(2)

(c) Another boy has a best high jump of 195 cm

Give a reason why you should **not** use a line of best fit to estimate his best long jump.

_____

_____

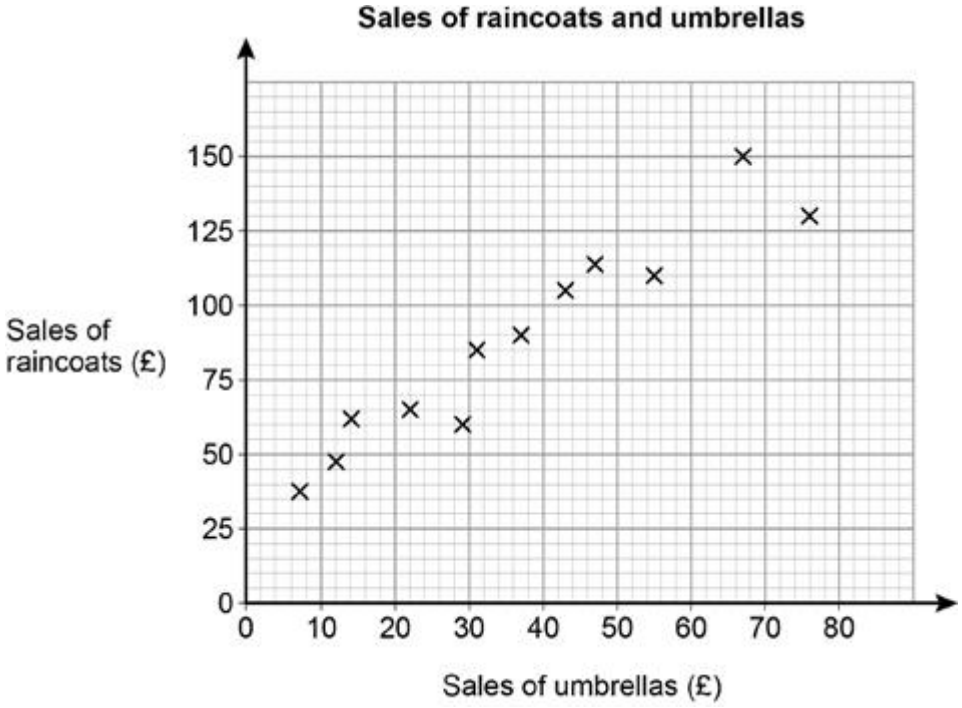
(1)

(Total 4 marks)

Q7.

A shop sells raincoats and umbrellas.

The scatter graph shows the monthly sales for 12 months.



(a) Write down the type of correlation shown by the graph.

Answer _____ °

(1)

(b) The manager expects the sales of umbrellas next month to be £60

Draw a line of best fit to estimate the sales of raincoats next month.

Answer £ _____

(3)

(Total 4 marks)

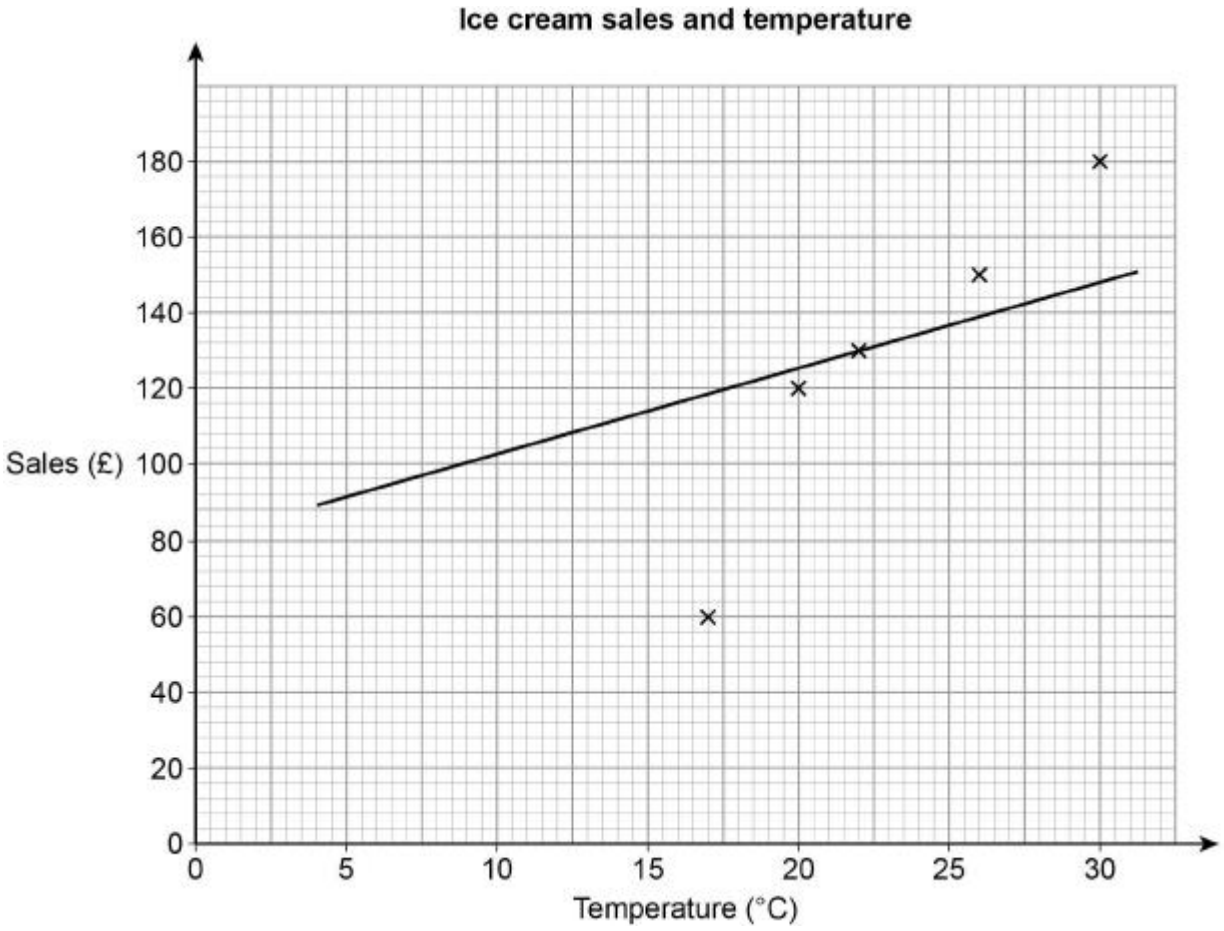
Q8.

Lee sells ice creams.

The table shows the midday temperature and his sales for five days.

	Day 1	Day 2	Day 3	Day 4	Day 5
Temperature (°C)	30	26	17	22	20
Sales (£)	180	150	80	130	120

(a) He draws this scatter graph and line of best fit.



Write down **two** mistakes he has made.

Mistake 1 _____

_____

Mistake 2 _____

_____

(2)

(b) Lee wants to work out the range of the five temperatures.

His calculation is 30 − 20 = 10

Is his method correct?
Tick a box.

Yes ☐ No ☐

Give a reason to support your answer.

_____

_____

(1)

(c) The table shows Lee's costs.

Ingredients	15% of sales
Fuel	£7 per day

Work out his total profit for the five days.

_____

_____

_____

_____

_____

_____

_____

Answer £ _____

(5)

(Total 8 marks)

Straight Line Graphs

Q1.

x	0	2	4	6	8	
y	3	7	11		19	23

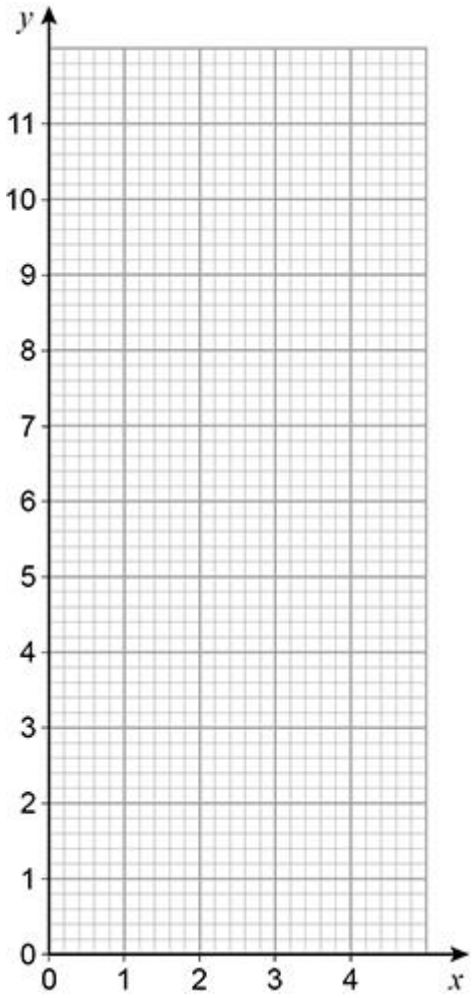
The x-values in the table make a linear sequence.

The y-values in the table make a different linear sequence.

(a) Complete the table.

(2)

(b) Draw a straight line passing through the points (0, 3), (2, 7) and (4, 11)



(2)

(c) Use the graph to work out the value of y when $x = 3$

$y =$ _____

(1)

(Total 5 marks)

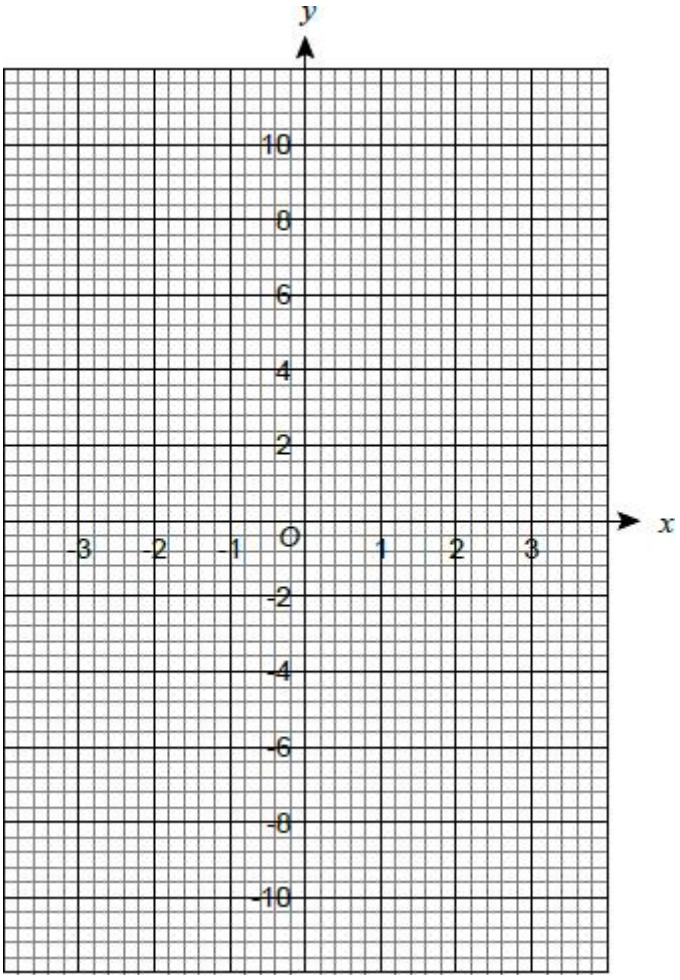
Q2.

(a) Complete the table for $y = 2x + 3$

x	−3	−2	−1	0	1	2	3
y	−3		1		5		

(2)

(b) On the grid draw the graph of $y = 2x + 3$ for values of x from −3 to 3



(2)

(c) Solve $x = 2x + 3$

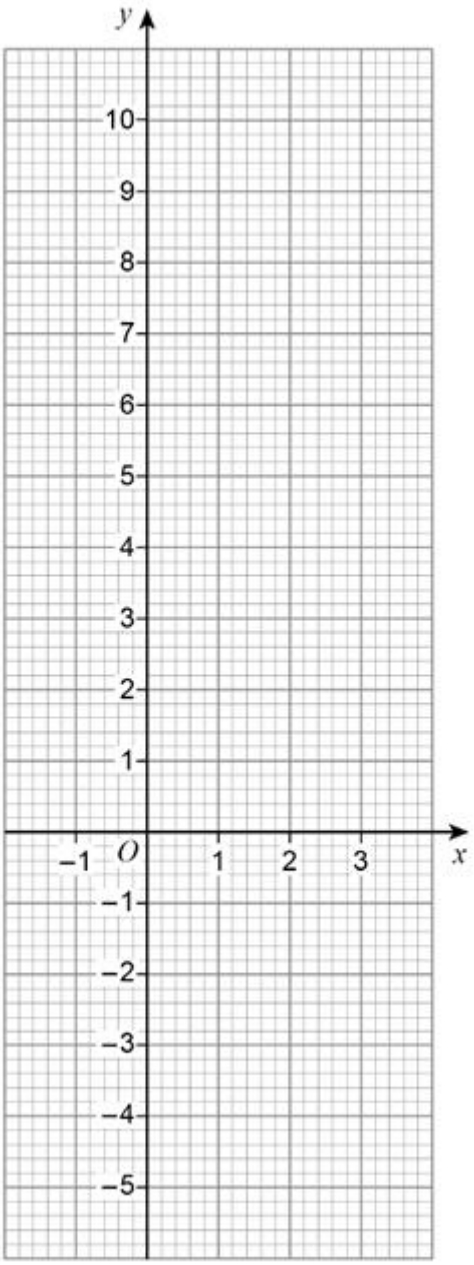
$x =$ _____

(2)

(Total 6 marks)

Q3.

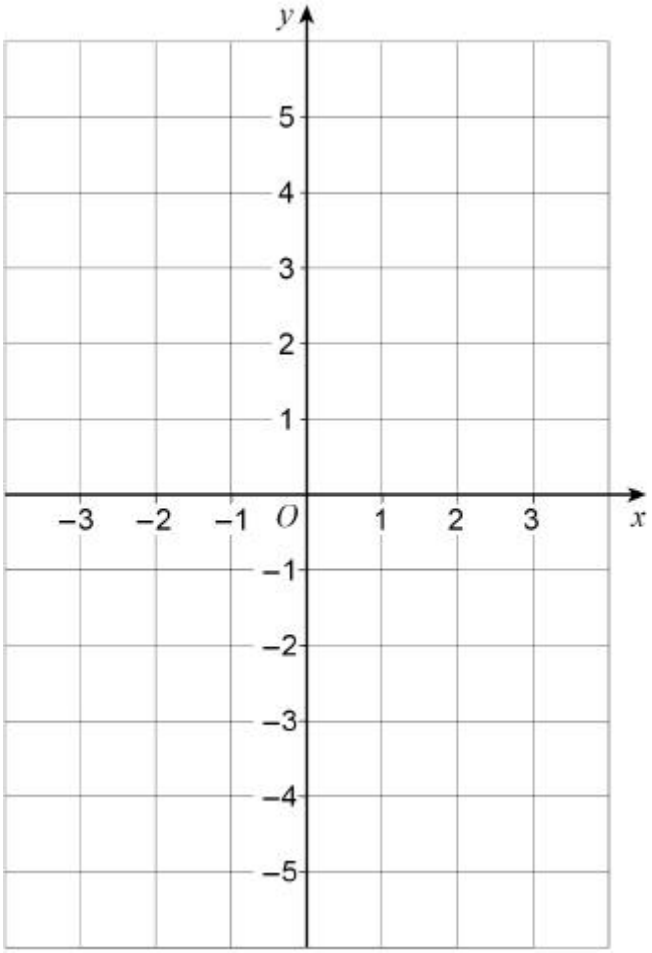
Draw the graph of $y = 3x - 1$ for values of x from –1 to 3



(Total 3 marks)

Q4.

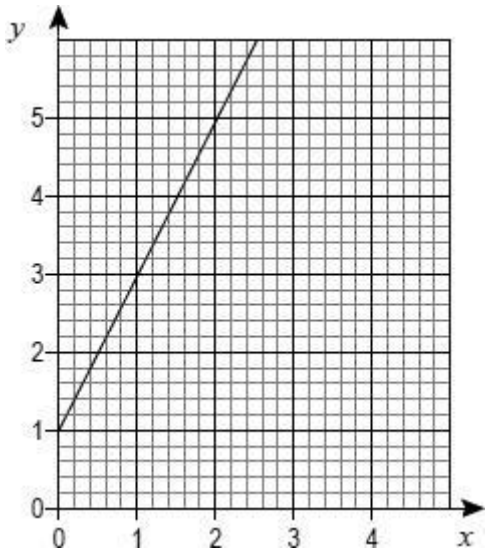
On the grid, draw the graph of $x + y = 2$ for values of x from −3 to 3



(Total 2 marks)

Q5.

Here is a graph of a straight line.



(a) Work out the equation of the line.

_____

_____

_____

Answer _____

(2)

(b) Work out the coordinates of the y-intercept of the line that

is parallel to the line in part **(a)**

and passes through (2, 2)

_____

_____

_____

Answer (_____ , _____)

(2)

(Total 4 marks)

Q6.

Circle the equation of the line parallel to $y = 5x + 2$

$y = 2x + 5$ $y = 5x - 2$ $y = -5x + 2$ $y = -2x - 5$

(Total 1 mark)

Q7.

Circle the equation of the line that is parallel to the x-axis.

$y = -5$ $\quad$ $x - y = 0$ $\quad$ $x = 3$ $\quad$ $x + y = 0$

(Total 1 mark)

Q8.

Write down the equation of the straight line that

passes through the point (0, 4)

and

is parallel to the line $y = 5x + 3$

_____

Answer _____

(Total 2 marks)

Q9.

Which of these is the equation of a straight line?

Circle your answer.

$y = 6x^2$ $\quad$ $y = x - 6$ $\quad$ $y = x^2 + 6$ $\quad$ $y = \frac{6}{x}$

(Total 1 mark)

Q10.

A line has the equation $y = 3x - 5$

(a) Write down the gradient of the line.

Answer _____

(1)

(b) Write down the y-intercept of the line.

Answer _____

(1)

(Total 2 marks)

Q11.

Work out the gradient of the straight line $y - 3x + 1 = 0$

Answer _____

(Total 2 marks)

Q12.

Work out the gradient of the straight line through (–2, 3) and (1, 9)

Answer _____

(Total 2 marks)

Q13.

Circle the equation of the line that is parallel to $y = \frac{1}{2}x + 3$

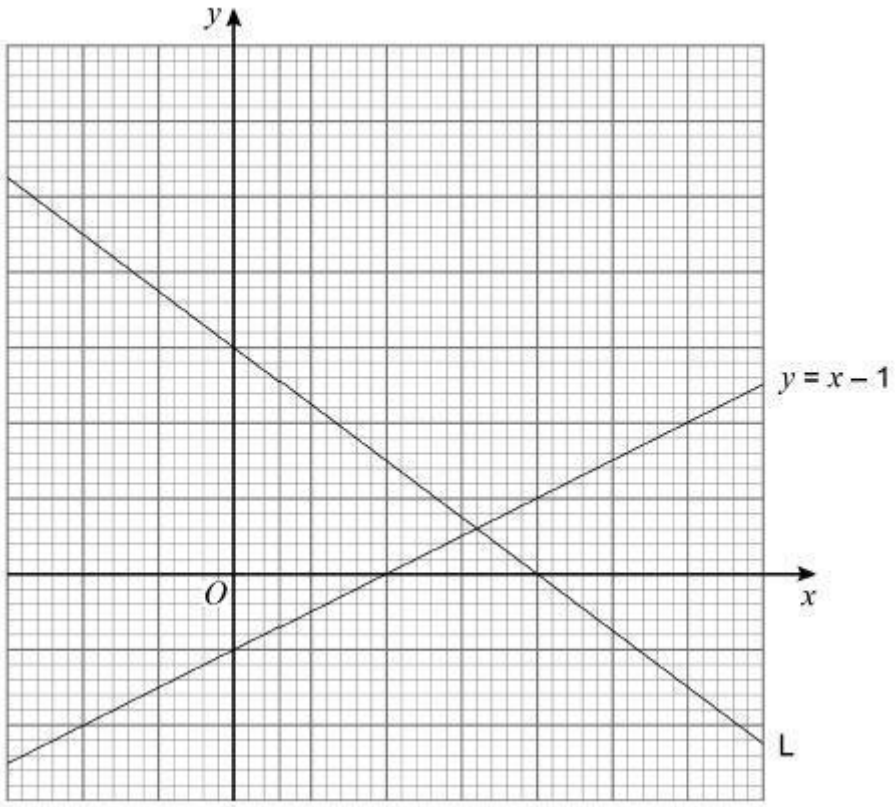
$y = -2x$ $y = 2x$ $y = \frac{1}{2}x$ $y = -\frac{1}{2}x$

(Total 1 mark)

Q14.

Here is line L and the graph of $y = x - 1$

The scales of the axes are not shown.



Work out the equation of line L.

Answer _____

(Total 4 marks)

Q15.

A straight line

has gradient 4

and

passes through the point (5, 23)

Work out the equation of the line.

Give your answer in the form $y = mx + c$

Answer _____

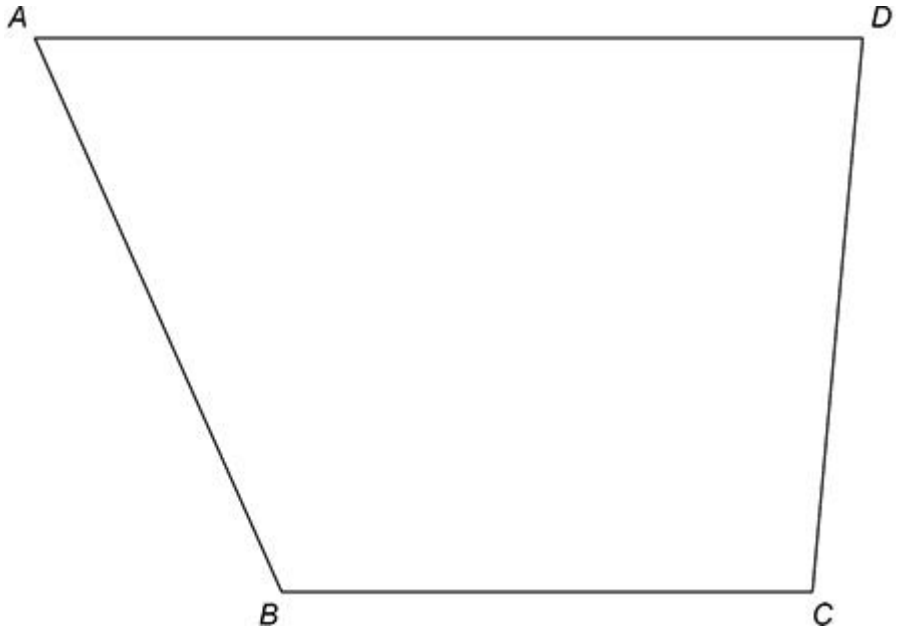
(Total 3 marks)

Loci and Construction

Q1.

Use a ruler and compasses in this question.

ABCD represents a garden.



A tree is to be planted in the garden.
The tree will be in the region that is closer to *AB* than to *BC*.

Label the region, R, where the tree could be planted.
Show all your construction lines.

(Total 3 marks)

Q2.

Use ruler and compasses for this question.

A wind turbine needs to be positioned

closer to port *Y* than port *X*

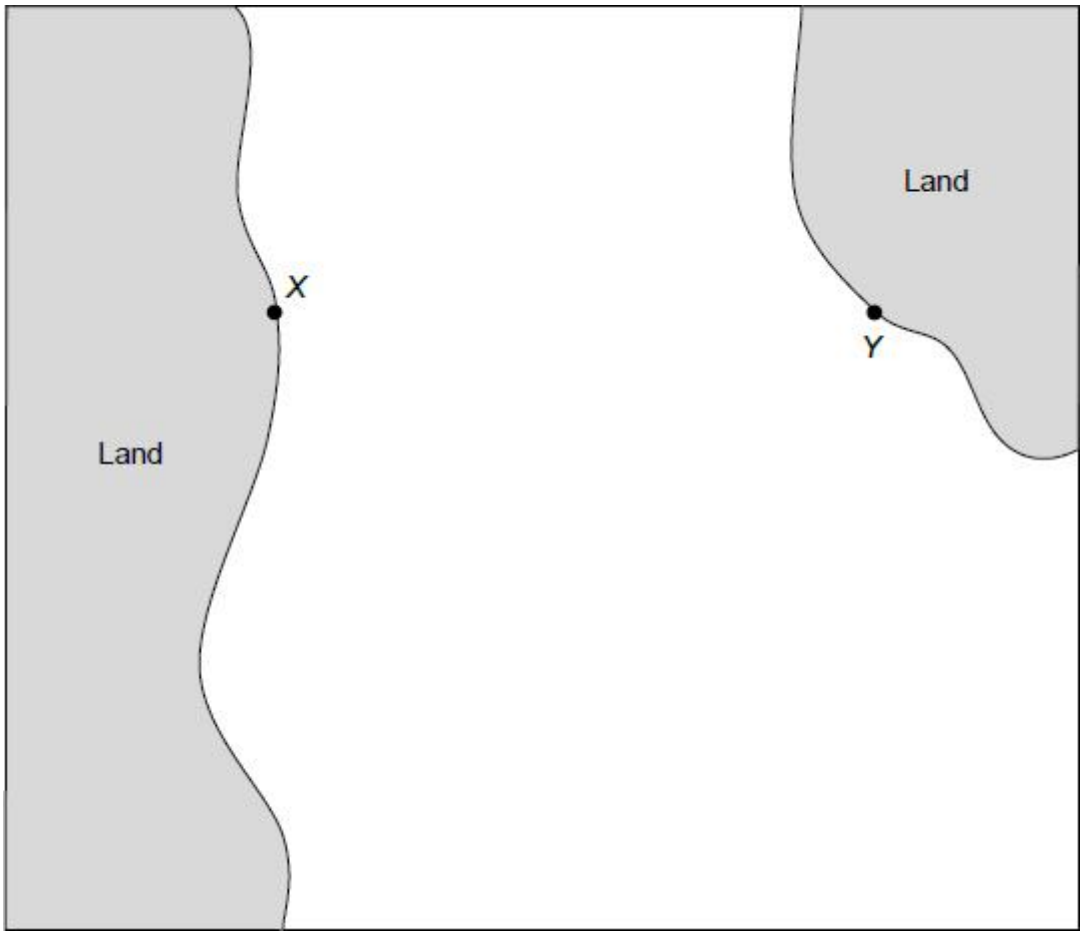
less than 12 km from *X*.

The map below shows the positions of *X* and *Y*.

On the map, show the region where the wind turbine could be positioned.

Label it *R*.

Scale 1 cm represents 2 km

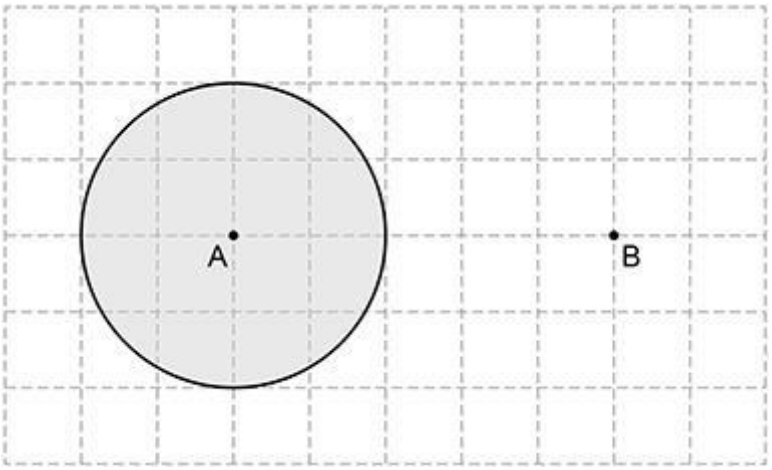


(Total 4 marks)

Q3.

Towns A and B are shown on a centimetre grid.

Scale: 1 cm represents 10 miles



What does the shaded area represent?

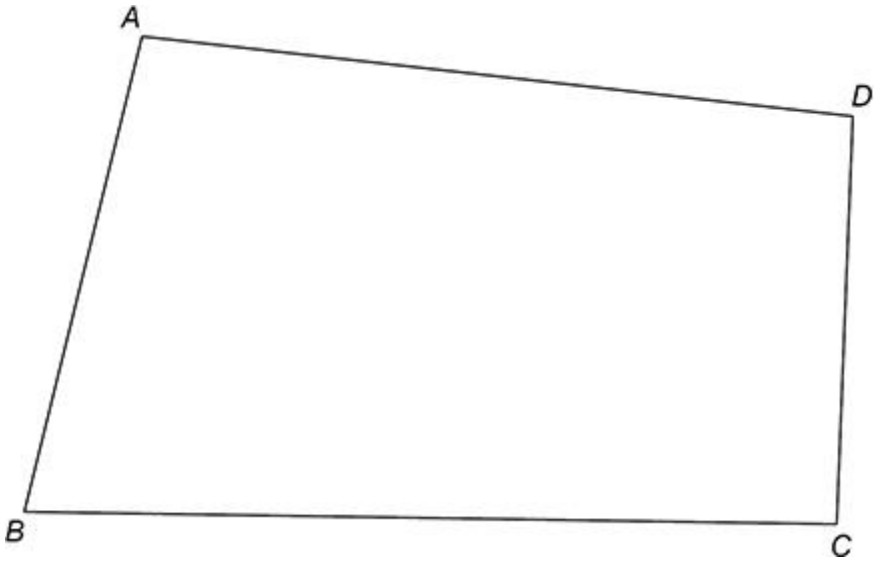
Tick **one** box.

- ☐ All the points nearer to A than to B
- ☐ All the points at least 30 miles from B
- ☐ All the points halfway between A and B
- ☐ All the points within 20 miles of A

(Total 1 mark)

Q4.

ABCD represents the plan of a field.



There is a path across the field that

starts at *B*

is the same distance from *BA* and *BC*.

Using ruler and compasses, show the position of the path.

(Total 2 marks)

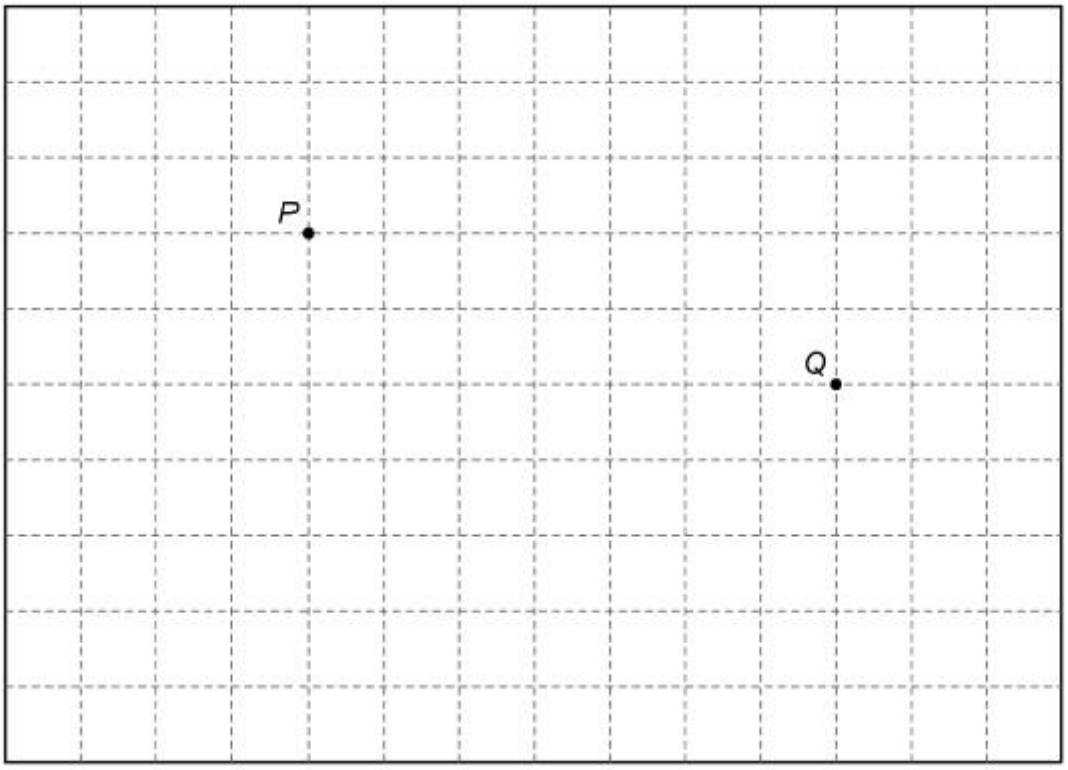
Q5.

The scale drawing represents a garden.

Water from a sprinkler at P reaches up to 20 metres from P.

Water from a sprinkler at Q reaches up to 25 metres from Q.

Scale: 1 cm represents 5 m



Using a pair of compasses,

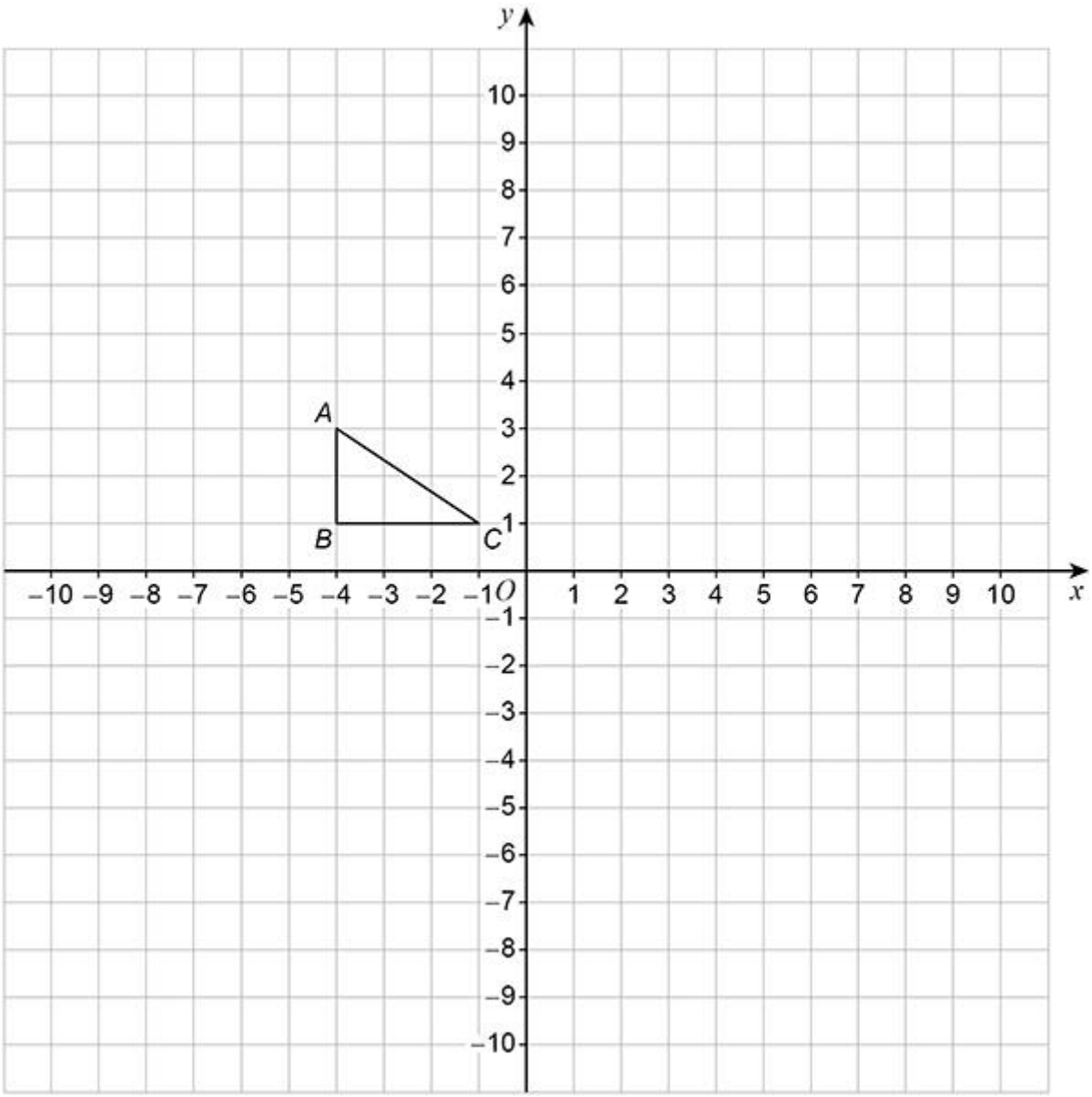
show the region that water from **both** sprinklers reaches.

(Total 2 marks)

Transformations

Q1.

Triangle *ABC* is drawn on a grid.



ABC is transformed to *A'B'C'* by a reflection in the line $x = 1$

A'B'C' is transformed to *A''B''C''* by a rotation 90° anticlockwise about (1, –4)

Which **one** point on *ABC* is invariant under the combined transformation?
You **must** show the result of each transformation on the grid.

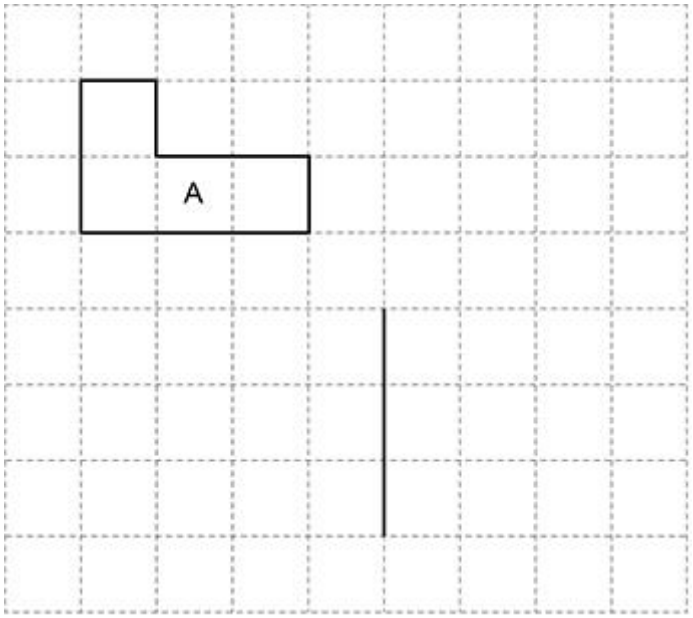
Answer _____

(Total 4 marks)

Q2.

On the grid, shape A is shown.

One side of shape B is also shown.



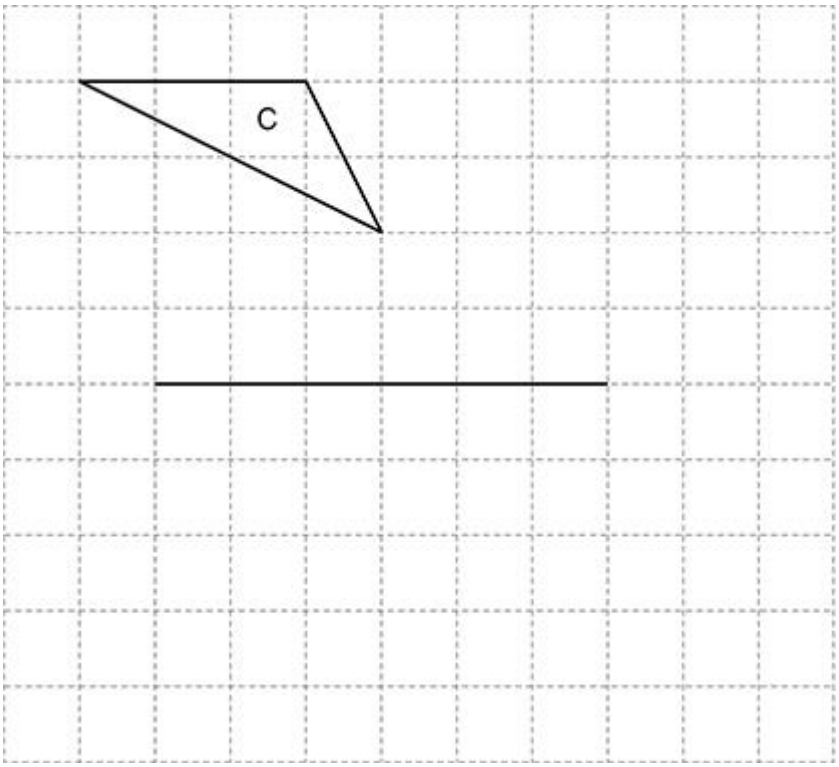
Complete shape B so that it is congruent to shape A.

(Total 1 mark)

Q3.

On this grid, shape C is shown.

One side of shape D is also shown.

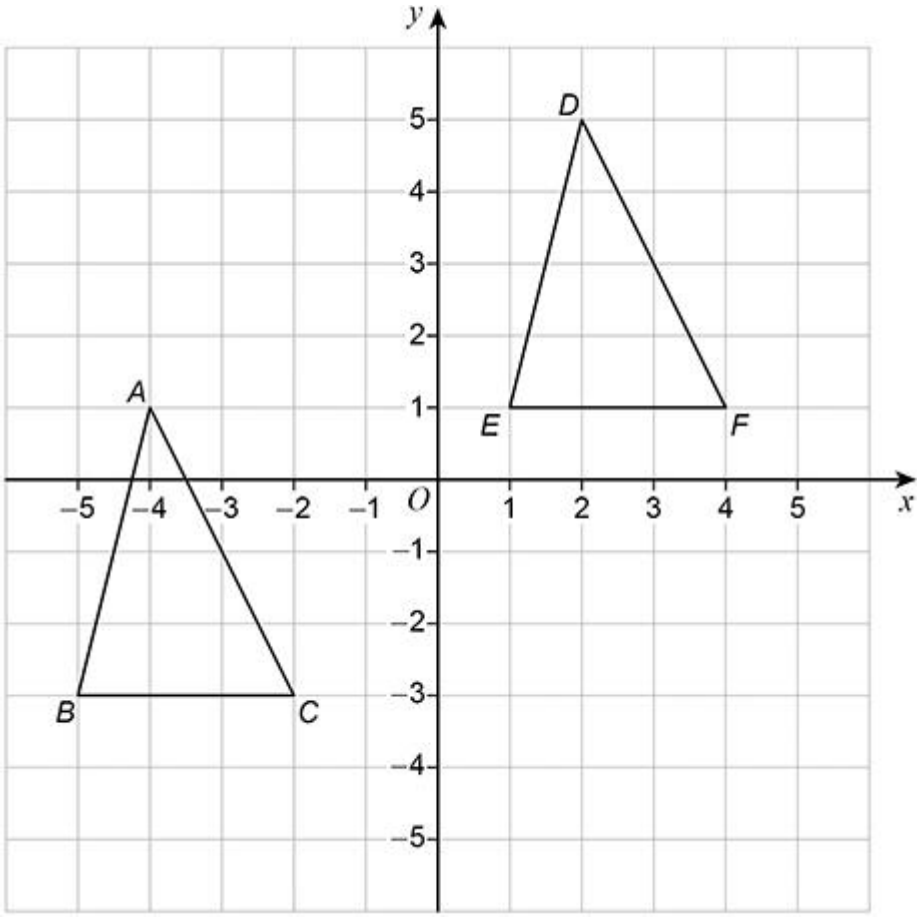


Complete shape D so that it is an enlargement of shape C with scale factor 2

(Total 1 mark)

Q4.

Triangles *ABC* and *DEF* are shown on a grid.

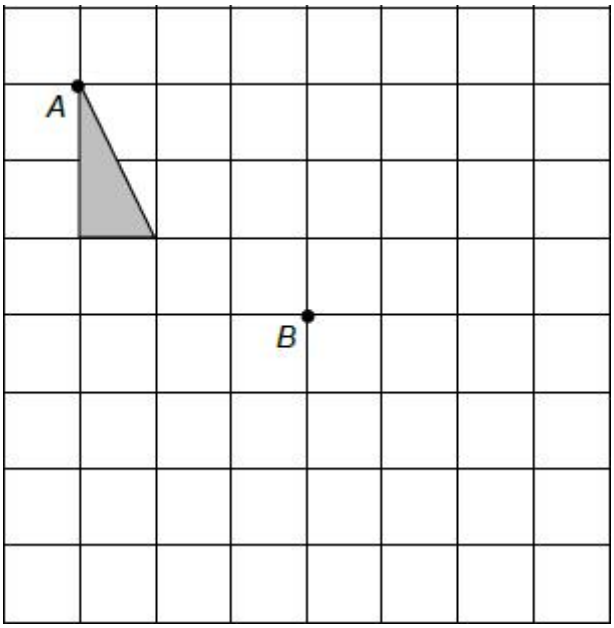


Describe a single transformation that shows the triangles are congruent.

(Total 2 marks)

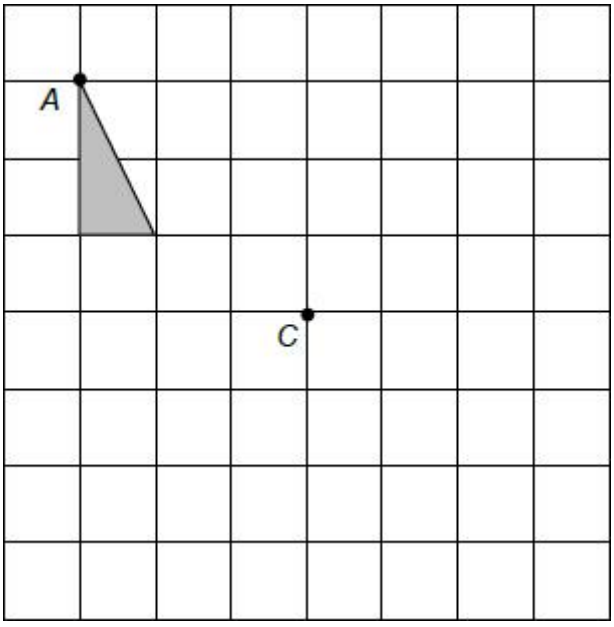
Q5.

(a) Translate the triangle so that point *A* moves to point *B*.



(1)

(b) Rotate the triangle **90° anti-clockwise** about point *C*.

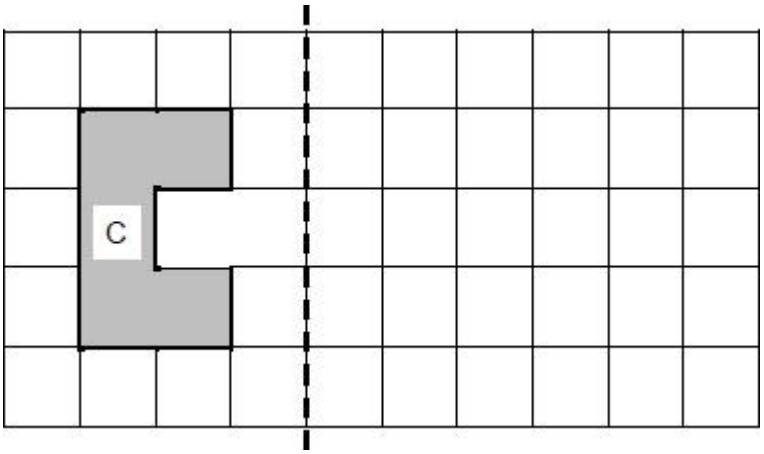


(2)

(Total 3 marks)

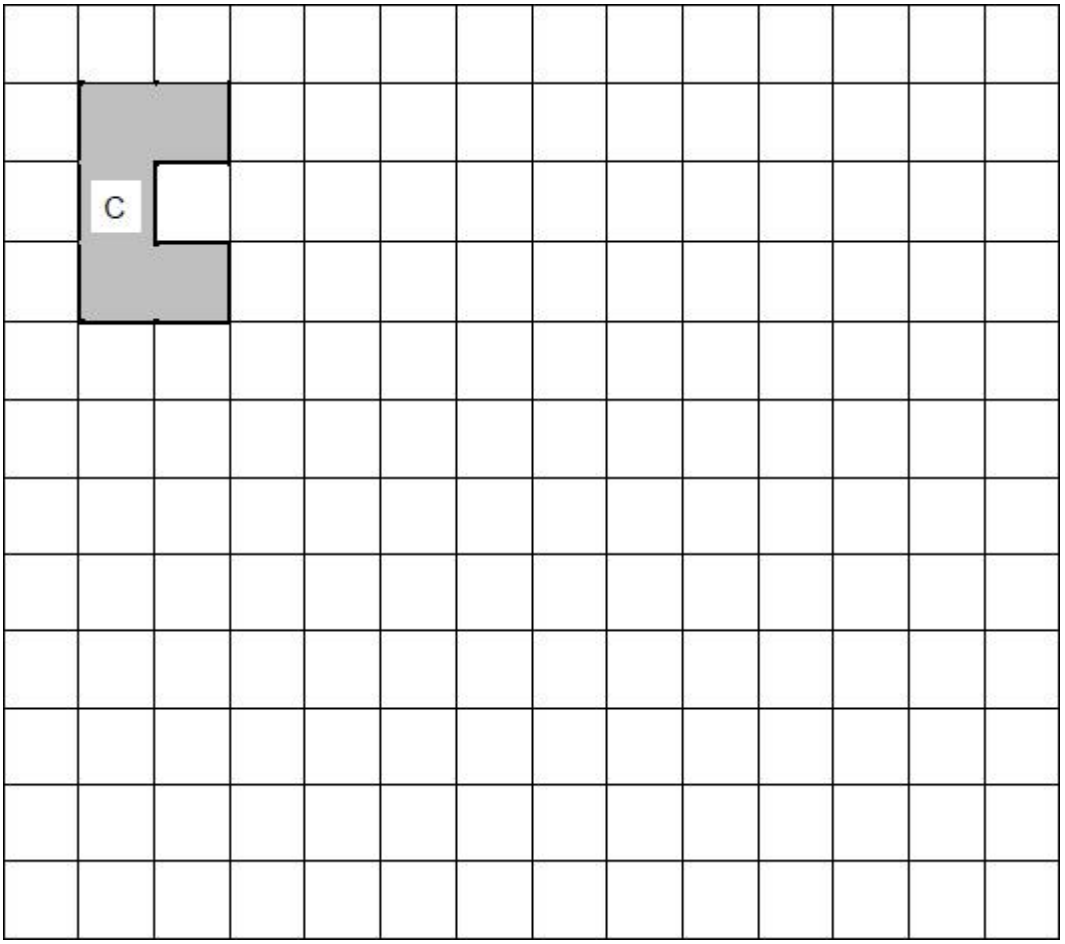
Q6.

(a) Reflect shape C in the mirror line.



(1)

(b) On this grid draw a shape that is an enlargement, scale factor 2, of shape C.

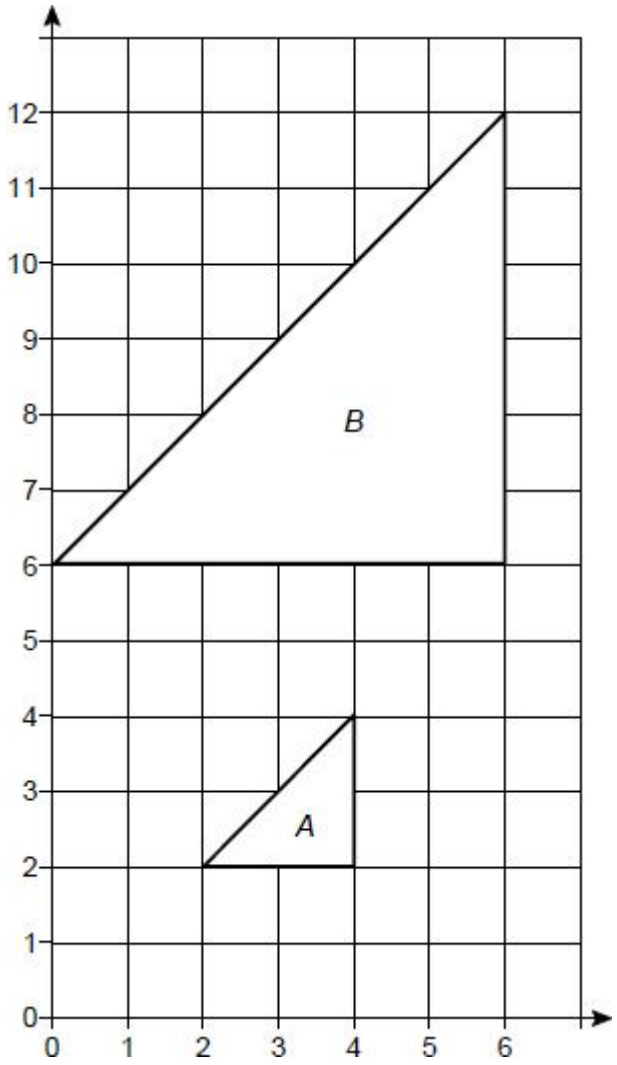


(1)

(Total 2 marks)

Q7.

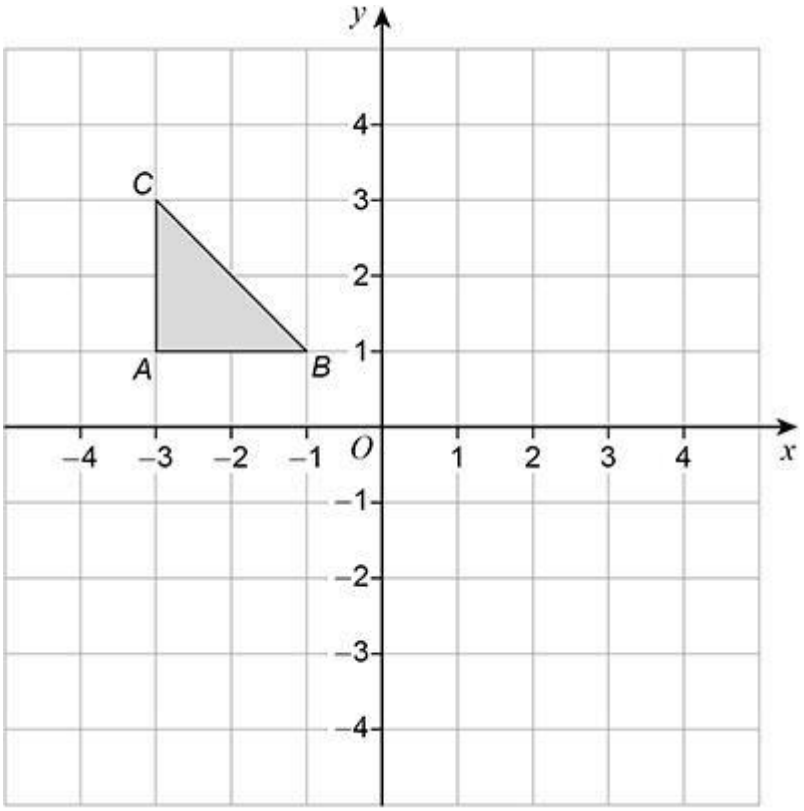
Describe fully the single transformation that maps triangle *A* to triangle *B*.



(Total 3 marks)

Q8.

Here is triangle *ABC* on a grid.



Describe a **single** transformation of the triangle so that

point *B* is invariant

point *A* moves to (1, 1)

point *C* moves to (1, –1)

_____

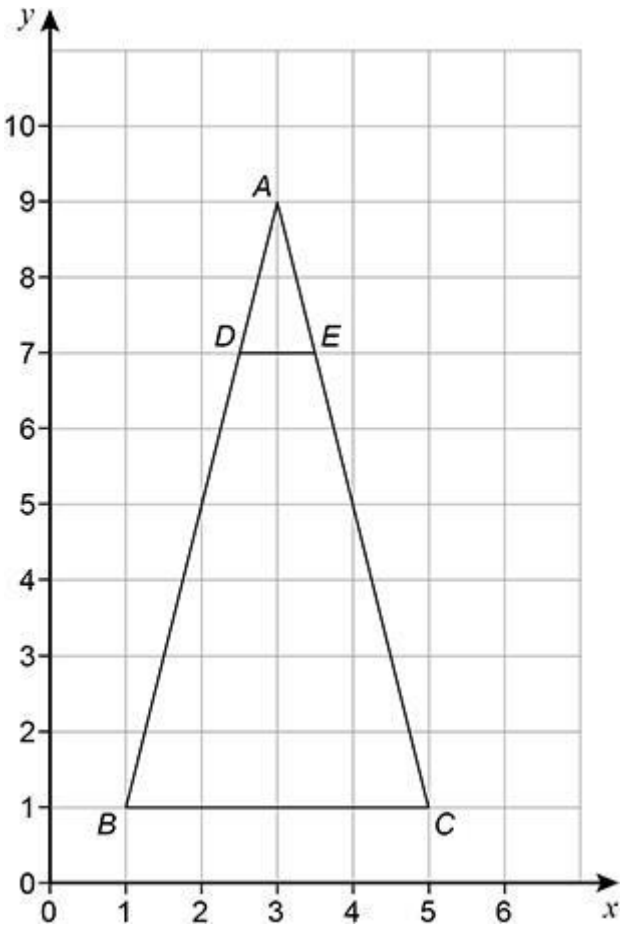
_____

_____

_____

(Total 3 marks)

Q9.



Describe fully the **single** transformation that maps triangle *ABC* to triangle *ADE*.

_____

_____

_____

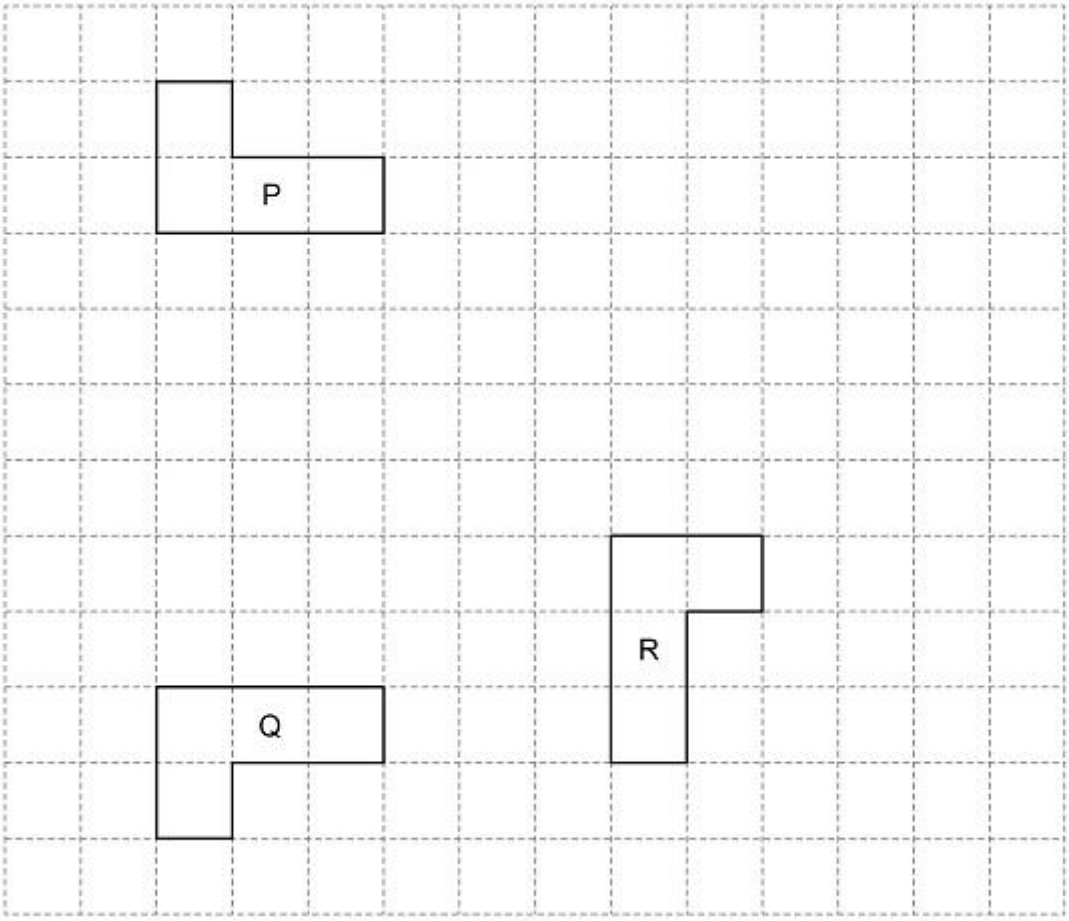
_____

_____

(Total 3 marks)

Q10.

Here are shapes P, Q and R.



(a) P is mapped to Q by a single transformation.

Circle the type of transformation.

rotation reflection translation enlargement

(1)

(b) P is mapped to R by a single transformation.

Circle the type of transformation.

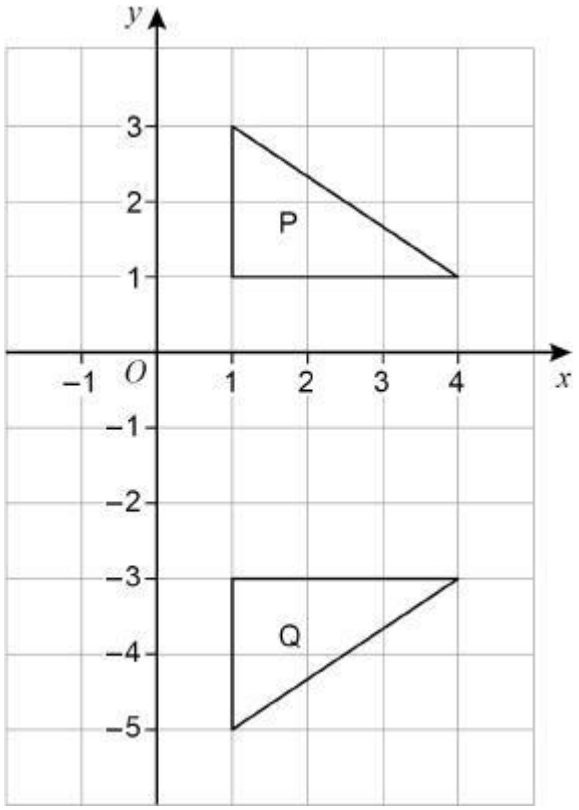
rotation reflection translation enlargement

(1)

(Total 2 marks)

Q11.

(a) Here are two triangles, P and Q.



Here is a statement.

A transformation that maps P to Q is a reflection in the line $x = -1$

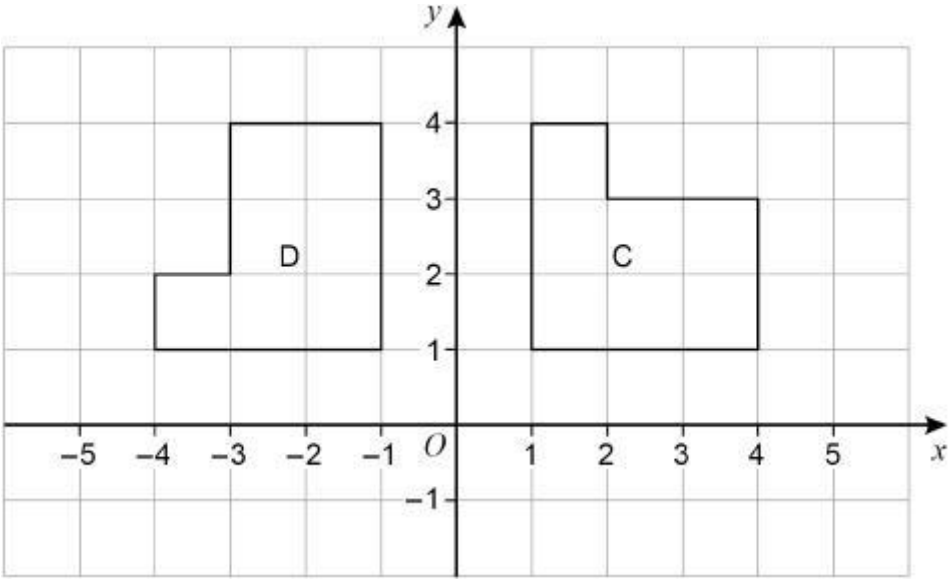
Make **one** criticism of the statement.

_____

_____

(1)

(b) Here are two shapes, C and D.



Here is a statement.

A transformation that maps C to D is a rotation through 90° anticlockwise.

Make **one** criticism of the statement.

_____

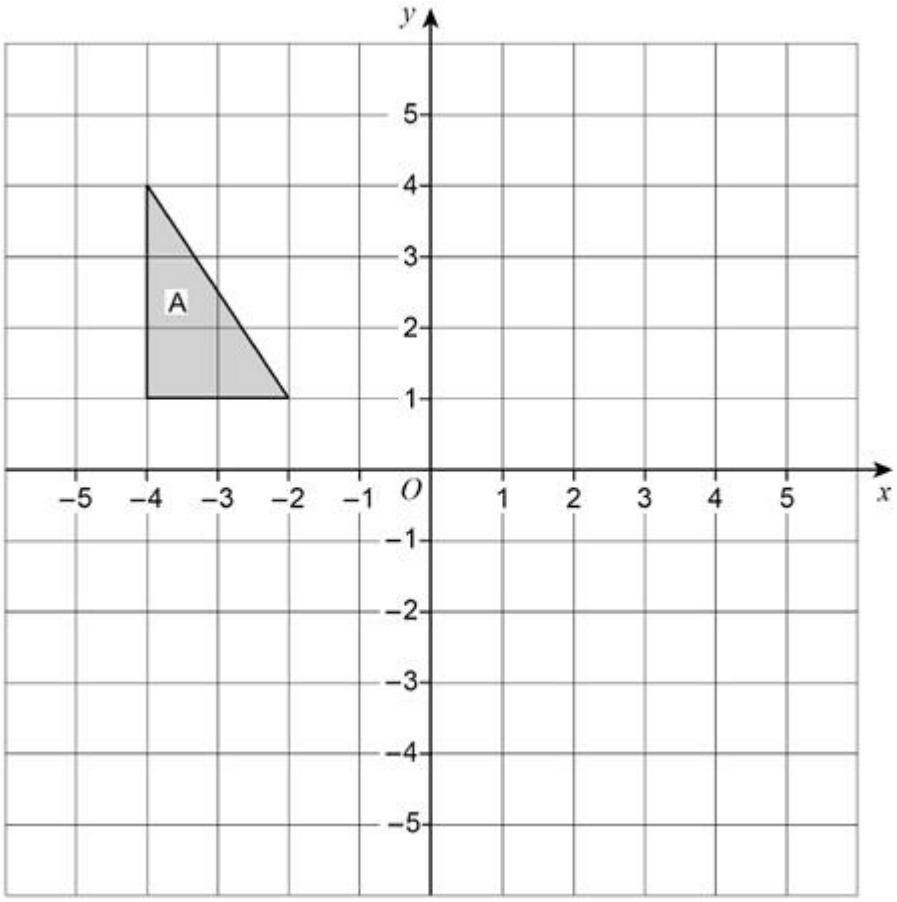
_____

(1)

(Total 2 marks)

Q12.

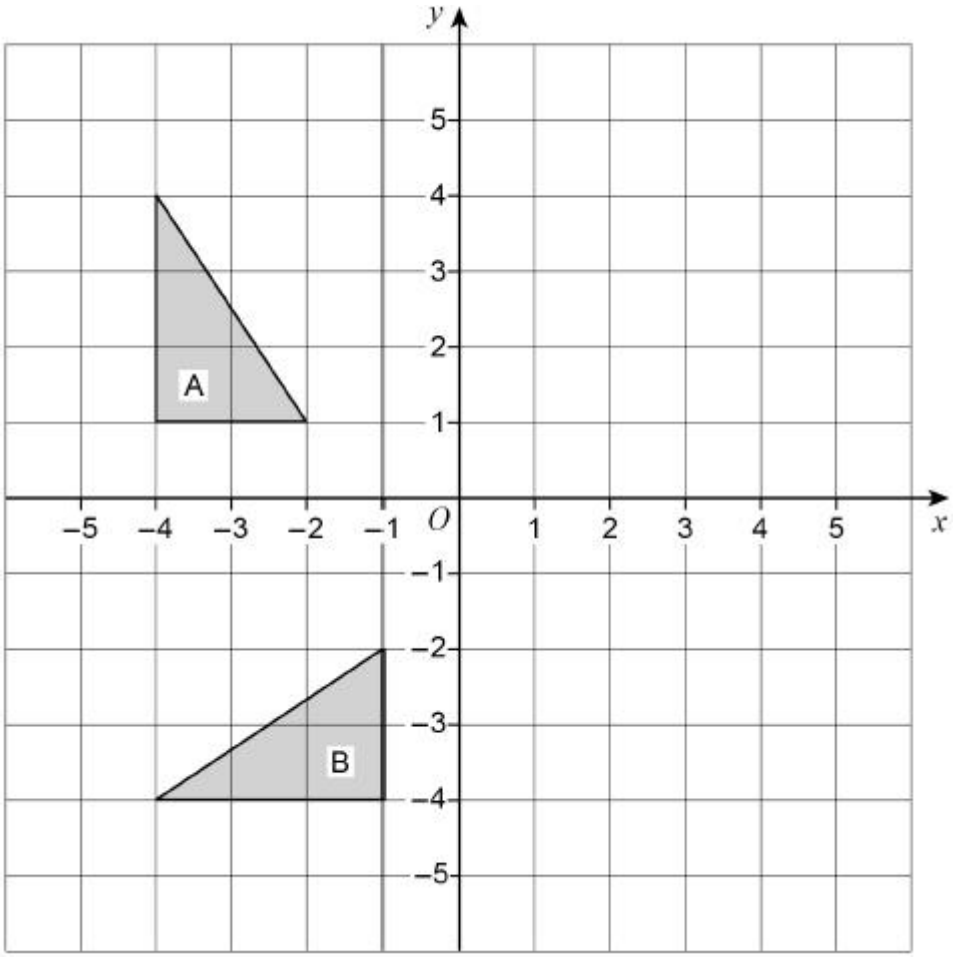
Reflect shape A in the x-axis.



(Total 2 marks)

Q13.

Describe fully the **single** transformation that maps shape A to shape B.



_____

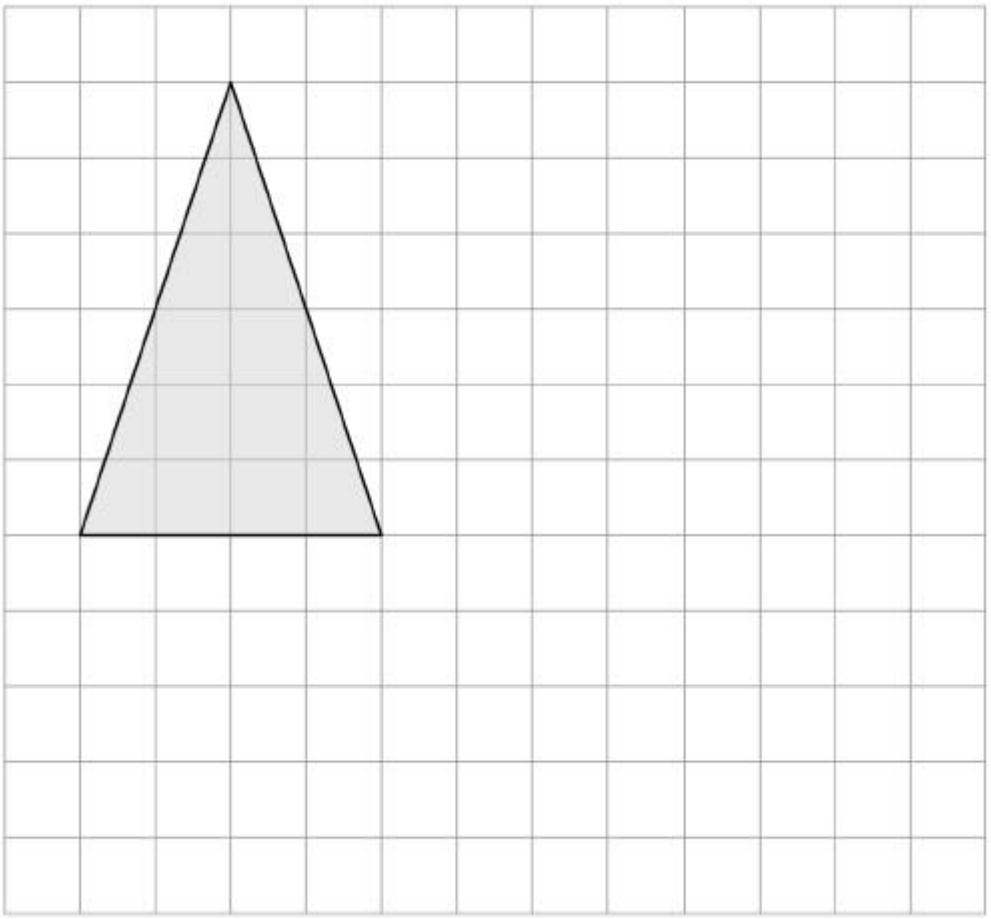
_____

_____

(Total 3 marks)

Q14.

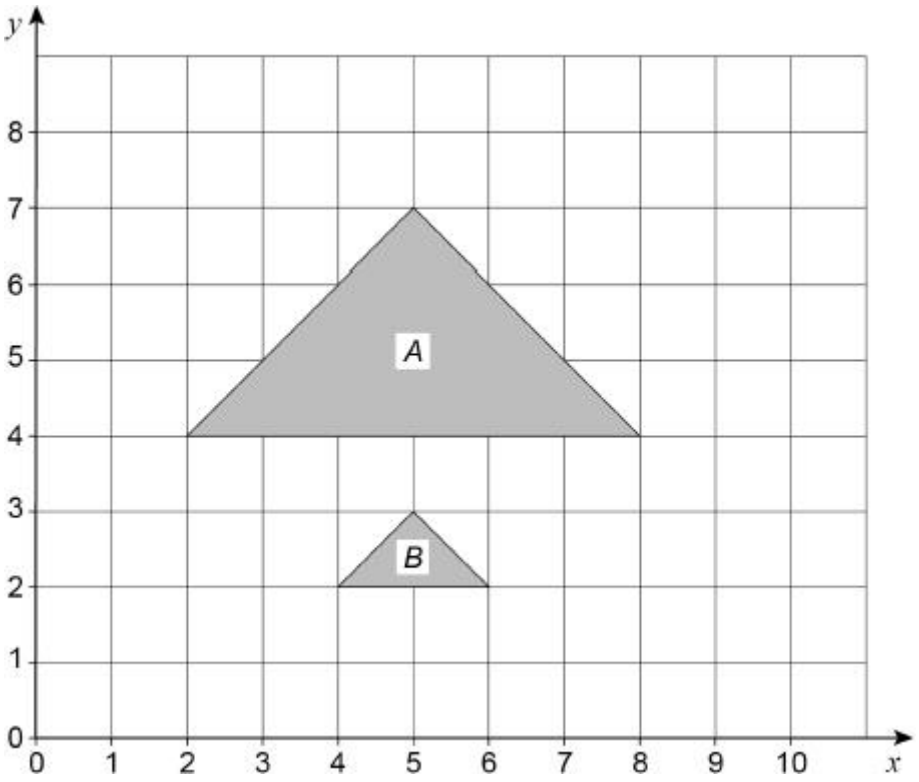
On the grid, draw an enlargement of the triangle with scale factor $\frac{1}{2}$



(Total 2 marks)

Q15.

Describe fully the **single** transformation that maps triangle *A* to triangle *B*.



_____

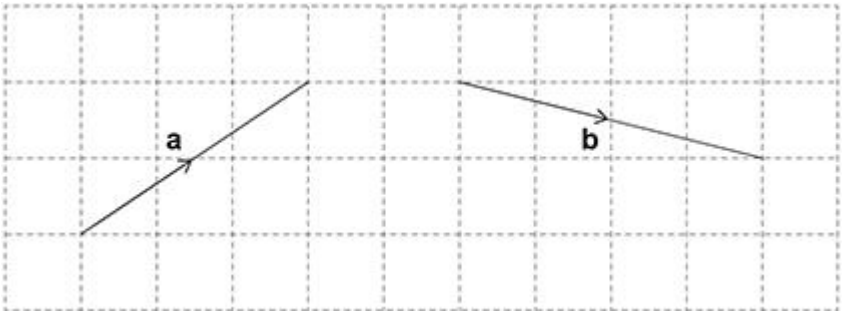
_____

(Total 3 marks)

Q16.

The diagram shows the vectors **a** and **b**.

As a column vector **a** = $\begin{pmatrix} 3 \\ 2 \end{pmatrix}$



(a) What is **b** as a column vector?

Answer $\begin{pmatrix} & \\ & \end{pmatrix}$

(2)

(b) Work out 4**a** as a column vector.

Answer $\begin{pmatrix} & \\ & \end{pmatrix}$

(1)

(c) $\mathbf{a} + \mathbf{c} = \begin{pmatrix} 3 \\ 0 \end{pmatrix}$

Work out **c** as a column vector.

Circle your answer.

$\begin{pmatrix} 2 \\ 0 \end{pmatrix}$ $\begin{pmatrix} 0 \\ 2 \end{pmatrix}$ $\begin{pmatrix} -2 \\ 0 \end{pmatrix}$ $\begin{pmatrix} 0 \\ -2 \end{pmatrix}$

(1)

(Total 4 marks)

Q17.

Work out $3\begin{pmatrix} 1 \\ 6 \end{pmatrix} + \begin{pmatrix} 2 \\ 5 \end{pmatrix}$

_____

_____

_____

Answer $\begin{pmatrix} & \\ & \end{pmatrix}$

(Total 1 mark)

Q18.

Work out $\begin{pmatrix} -4 \\ 8 \end{pmatrix} - \begin{pmatrix} 3 \\ -2 \end{pmatrix}$

Circle your answer.

$\begin{pmatrix} -7 \\ 10 \end{pmatrix}$ $\begin{pmatrix} -7 \\ 6 \end{pmatrix}$ $\begin{pmatrix} -1 \\ 10 \end{pmatrix}$ $\begin{pmatrix} -1 \\ 6 \end{pmatrix}$

(Total 1 mark)

Q19.

Here are two column vectors.

$\mathbf{f} = \begin{pmatrix} 4 \\ 2 \end{pmatrix}$ $\mathbf{g} = \begin{pmatrix} 4 \\ -1 \end{pmatrix}$

Work out $4\mathbf{f} - 3\mathbf{g}$

Answer $\begin{pmatrix} \_ \\ \_ \end{pmatrix}$

(Total 2 marks)

Notes