

GCSE Revision - A BIT OF EVERYTHING

OCR
Higher



Corbettmaths

This is a collection of questions from all the topics on the revision checklist

Answers

Q1 to Q50

Guidance

1. Check your answers seem right.
2. Always show your workings
3. Take your time when working through this collection of questions

Revision for this test

www.corbettmaths.com/contents



Question	Topic	Video number
90	Volume of Cone/Pyramid/Sphere	359, 360, 361
91	Conditional Probability	247
92	Congruent Triangles	67
93	Algebraic Proof	365
94	Exact Trig Values	341
95	Ratio - Problem Solving	270, 271
96	Area Under a Graph	389
97	Geometric Proof	366
98	Invariant Points	392

1. Work out

$$4\frac{1}{3} - 3\frac{4}{9}$$

Give your answer as a fraction.

$$\begin{aligned} & \frac{13}{3} - \frac{31}{9} \\ &= \frac{39}{3} - \frac{31}{9} \\ &= \frac{8}{9} \end{aligned}$$

8/9

(3)

2. Candles normally cost £6 each.

Two websites have special offers

Corbettmaths Candles

Candles'R'us

Buy 3 get 1 free

20% off

Laura wants to buy 30 candles.

Which website should Laura use?

$$\begin{aligned} \text{CC} : & 7 \text{ lots of buy 3 get 1 free} + 2 \text{ extra} \\ &= 7 \times £18 + £6 + £6 = £138 \end{aligned}$$

$$\begin{aligned} \text{Candles 'R' us} : & 30 \times 6 = £180 & £180 - £36 = & (4) \\ & 20\% = £36 & £144 \end{aligned}$$

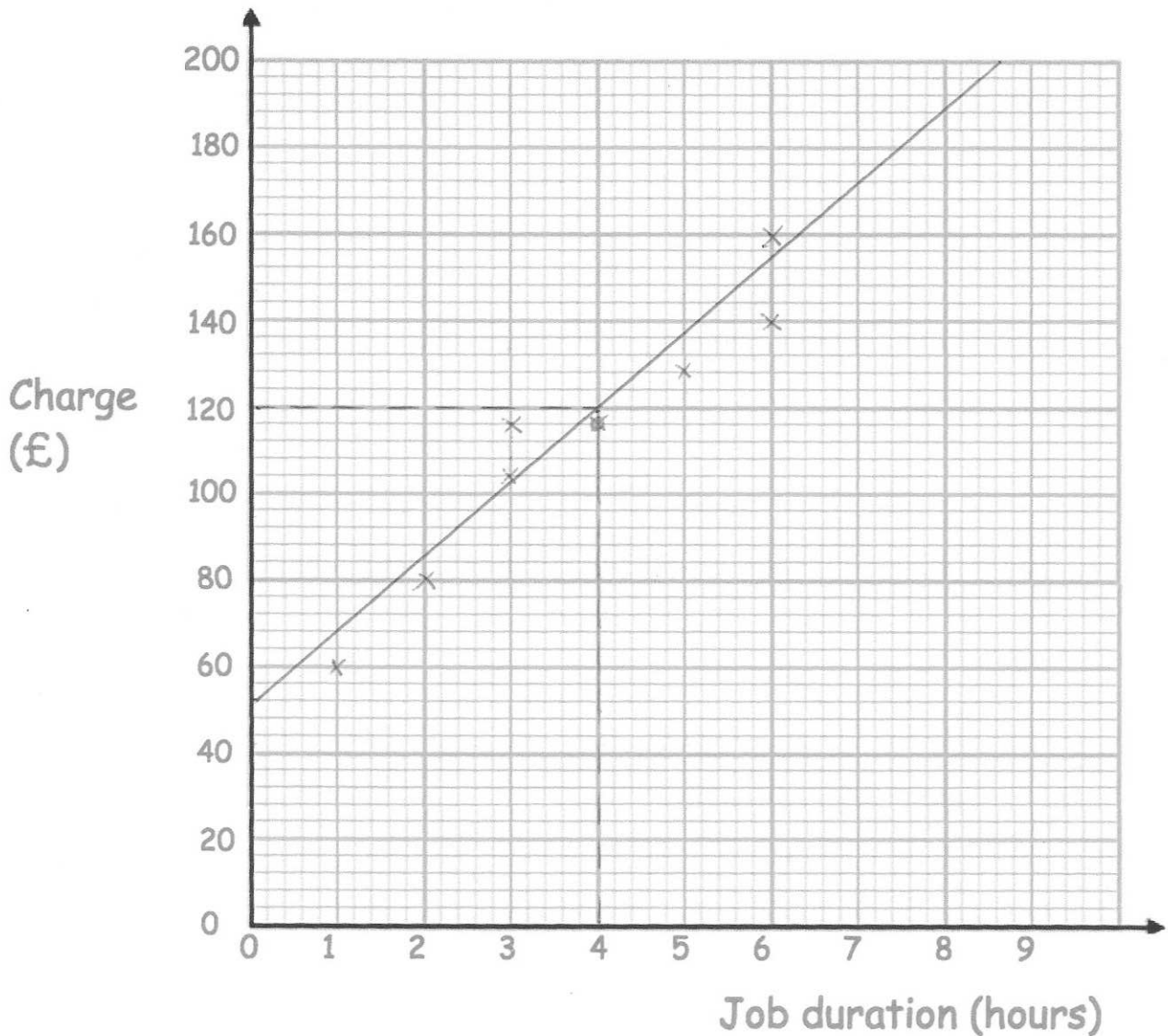
Corbettmaths Candles are best value

3. The table shows the charge (£) by plumbers for jobs of different duration (hours).

Job duration (hours)	1	2	3	3	5	6	6
Charge (£)	60	80	104	116	128	140	160

(a) Plot the data on the scatter graph below.

(2)



(b) Describe the correlation.

There is a positive correlation; which means as the job duration increases, so does the charge.

(1)

(c) Draw a line of best fit on the scatter graph.

(1)

(d) Use your line of best fit to estimate the charge for a 4 hour job.

£ 120
(1)

(e) Explain why it may **not** be appropriate to use your line of best fit to estimate the charge for a job lasting 12 hours.

It is beyond the range of the data. It is extrapolation, therefore may not be reliable.
(1)

4. The number of visitors to some tourist attractions is shown in the table below.

The King's Palace	5.4 million
Castle	923,840
Theme Park	1.43×10^7
Science Museum	4,192,900

(a) Write the number of visitors to the Theme Park as an ordinary number.

14300000
(1)

(b) Write the number of visitors to the Castle in standard form.

9.2384×10^5
(1)

(c) How many more people visited the Theme Park than the Science.

$$\begin{array}{r} 14300000 \\ - 4192900 \\ \hline 10107100 \end{array}$$

10107100
(2)

5.

Work out

$$5\frac{1}{2} \times 1\frac{2}{3}$$

Give your answer as a mixed number.

$$\frac{11}{2} \times \frac{5}{3}$$
$$= \frac{55}{6}$$

$$\frac{55}{6} = 9\frac{1}{6}$$

(3)

6.

Work out

$$\frac{2}{17} \div \frac{2}{5}$$

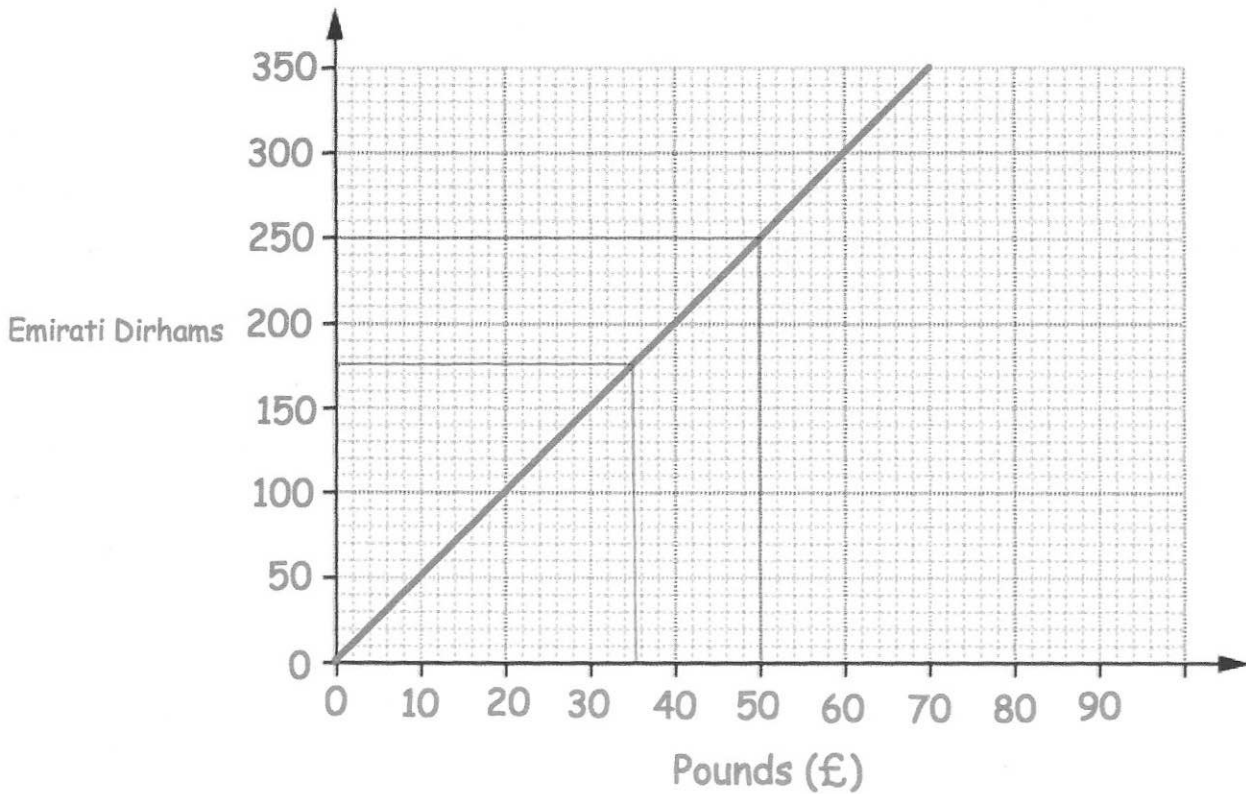
Give your answer as a fraction in its simplest form.

$$\frac{2}{17} \times \frac{5}{2} = \frac{10}{34} = \frac{5}{17}$$

$$\frac{5}{17}$$

(2)

7.



(a) Convert £50 into Dirhams.

.....250.....Dirhams
(1)

(b) Convert 175 Dirhams into Pounds (£).

£.....35.....
(1)

Tom wants to buy a camera.
In London the camera costs £380.
In Abu Dhabi the camera costs 2000 Dirhams.

In which city is the camera cheaper and by how much?
Give your answer in pounds.

$$200 \text{ Dirhams} = \text{£}40$$

$$2000 \text{ Dirhams} = \text{£}400$$

City: London £.....20.....
(1)

8. Use approximations to estimate the value of

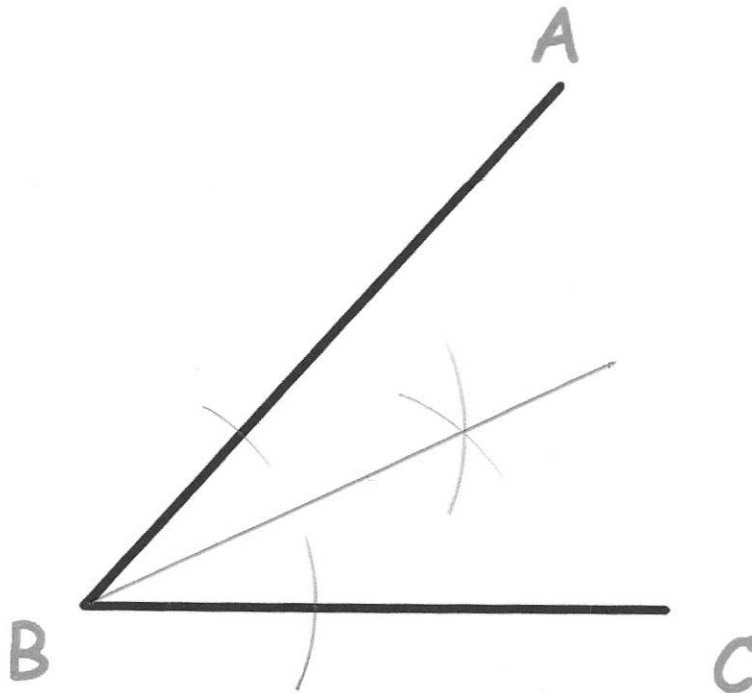
$$\frac{4.12 \times 1.89}{0.21}$$

$$\approx \frac{4 \times 2}{0.2}$$
$$= \frac{8}{0.2} = \frac{80}{2}$$

$$\frac{40}{\dots\dots\dots}$$

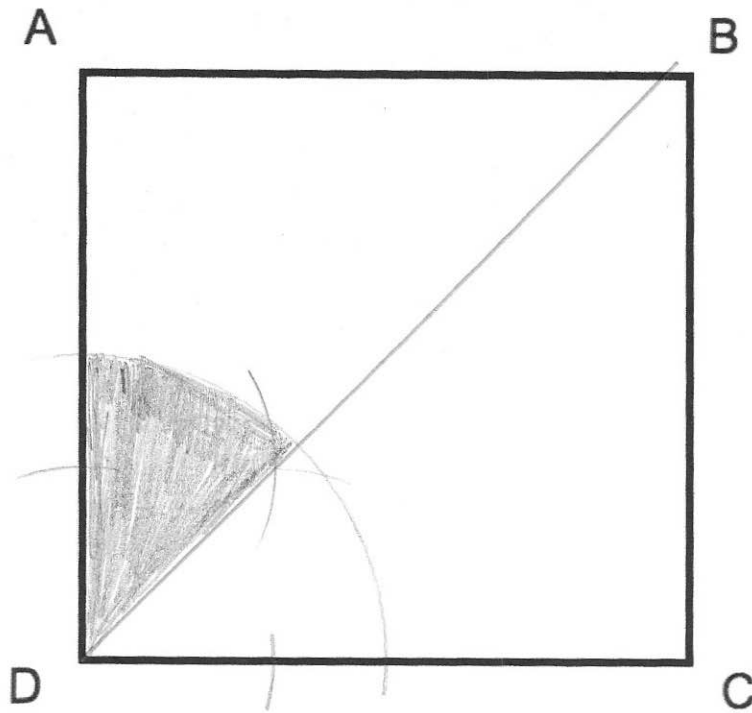
(3)

9. Using ruler and compasses, construct the bisector of angle ABC.



(2)

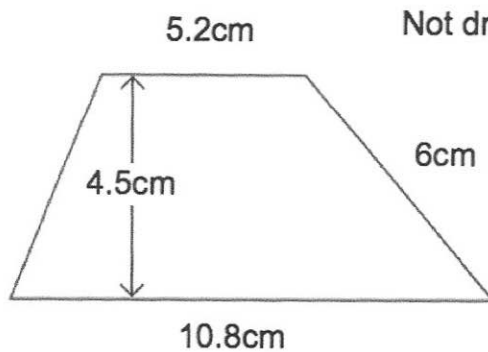
10. A and B are two points.



Shade the region inside the rectangle, which is closer to AD than DC, and less than 4cm from D.

(3)

- 11.

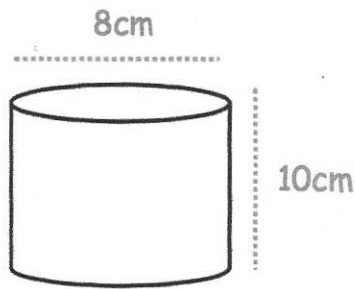


$$\begin{aligned}
 & \frac{1}{2}(a+b)h \\
 &= \frac{1}{2}(5.2+10.8) \times 4.5 \\
 &= \frac{1}{2}(16) \times 4.5 \\
 &= 36
 \end{aligned}$$

Calculate the area of the trapezium.

.....36.....cm²
(2)

12. Below is a cylinder with diameter 8cm and 10cm.



Find the volume of the cylinder.
Give your answer in terms of π

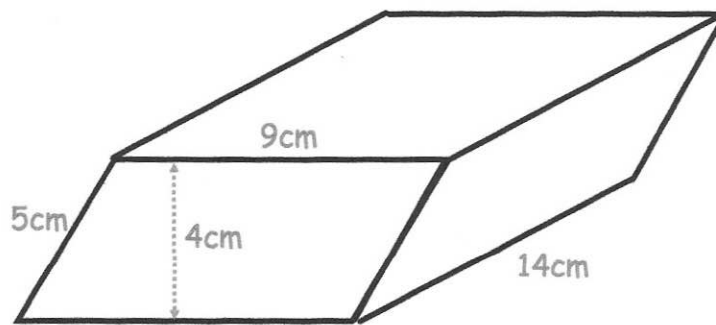
$$r = 4$$
$$h = 10$$

$$V = \pi r^2 h$$
$$= \pi \times 4^2 \times 10$$
$$= 160\pi$$

$$\dots\dots\dots 160\pi \dots\dots \text{cm}^3$$

(3)

13. Shown below is a prism.
The cross-section is a parallelogram.



Find the volume of the prism.

$$4 \times 9 = 36$$
$$36 \times 14 =$$

$$\dots\dots\dots 504 \dots\dots \text{cm}^3$$

(3)

14. James has x pence.
Hannah has 5 pence more than James. $x+5$
Liam has 2 pence less than James. $x-2$

The total amount of money they have is 75 pence.

- (a) Use this information to write down an equation in x .

$$x + (x + 5) + (x - 2) = 75$$
$$3x + 3 = 75$$

$$\dots\dots\dots 3x + 3 = 75$$

(2)

- (b) Solve the equation to find out how much money James has.

$$3x + 3 = 75$$
$$-3 \quad -3$$

$$3x = 72$$

$$x = 24$$

$$\dots\dots\dots 24 \dots\dots \text{pence}$$

(2)

15. On a particular day, 98 people visit a leisure centre.
 Some are going to the gym.
 Some are going to play tennis.
 Some are going to play badminton.
 The rest are going swimming.

51 of the people are adults.
 21 out of the 40 going to the gym are adults.
 19 adults and 7 children are going swimming.
 7 out of the 20 people playing badminton are adults.
 Twice as many children play tennis than adults.

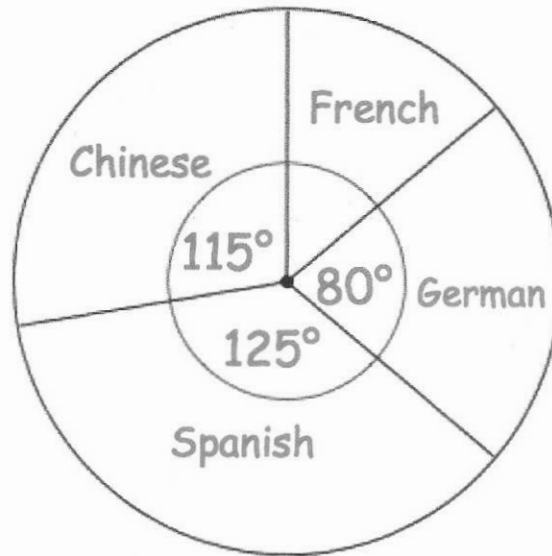
How many children play tennis?

	Adults	Children	Total
Gym	21	19	40
Tennis	4	8	12
Badminton	7	13	20
Swimming	19	7	26
Total	51	47	98

8

(2)

16. The pie chart shows information about the languages studied in a school. There are 648 students in the school. Each student studies one language.



How many more students study German than French?

$$\begin{aligned} \text{German} &= \frac{80}{360} \text{ of } 648 \\ &= \frac{2}{9} \text{ of } 648 \\ &= 144 \end{aligned}$$

$$\begin{aligned} \text{French} &= \frac{40}{360} \text{ of } 648 \\ &= \frac{1}{9} \text{ of } 648 \\ &= 72 \end{aligned}$$

$$144 - 72 = 72$$

$$\begin{array}{r} 72 \\ \hline \end{array}$$

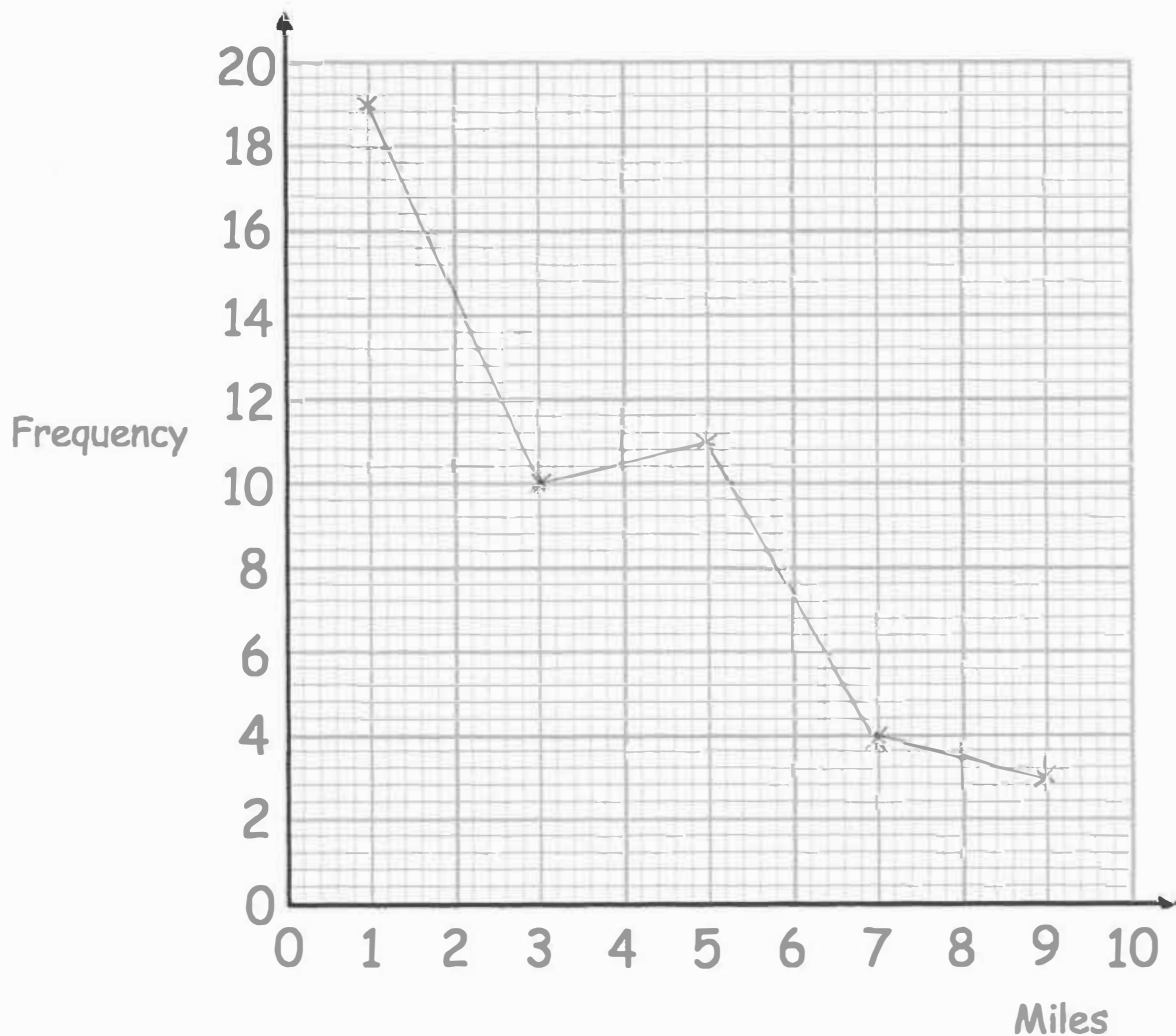
(4)

17. The table shows the distance travelled to school by 47 students.

Distance (miles)	Frequency
$0 < d \leq 2$	19
$2 < d \leq 4$	10
$4 < d \leq 6$	11
$6 < d \leq 8$	4
$8 < d \leq 10$	3

(a) Draw a frequency polygon to represent this data.

(2)



One student is chosen at random.

(b) Work out the probability that this student travels more than 6 miles to school.

$$\frac{7}{47}$$

(1)

18. The Highest Common Factor (HCF) of two numbers is 6.
The Lowest Common Multiple (LCM) of the same numbers is 60.

What are the two numbers?

12 and 30

6 and 60 etc.

..... and

(2)

-
19. Simplify

$$(2m^4)^3$$

..... $8m^{12}$

(2)

-
20. Jim picks a five digit odd number.
The second digit is less than 5.
The fourth digit is a cube number The first digit is a prime number.
How many different numbers could he pick?

1st 2nd 3rd 4th 5th

$$4 \times 5 \times 10 \times 2 \times 5$$

..... 2000

(3)

21. Given that $a = 4$, $b = 9$ and $c = -5$

Work out the value of

$$\frac{ab + 24}{2c} = \frac{36 + 24}{-10} = \frac{60}{-10}$$

$$\frac{-6}{\dots\dots\dots} \quad (3)$$

22. Make w the subject of the formula

$$g = \frac{w}{w - 5}$$

$$g(w - 5) = w$$

$$gw - 5g = w$$

$$gw - w = 5g$$

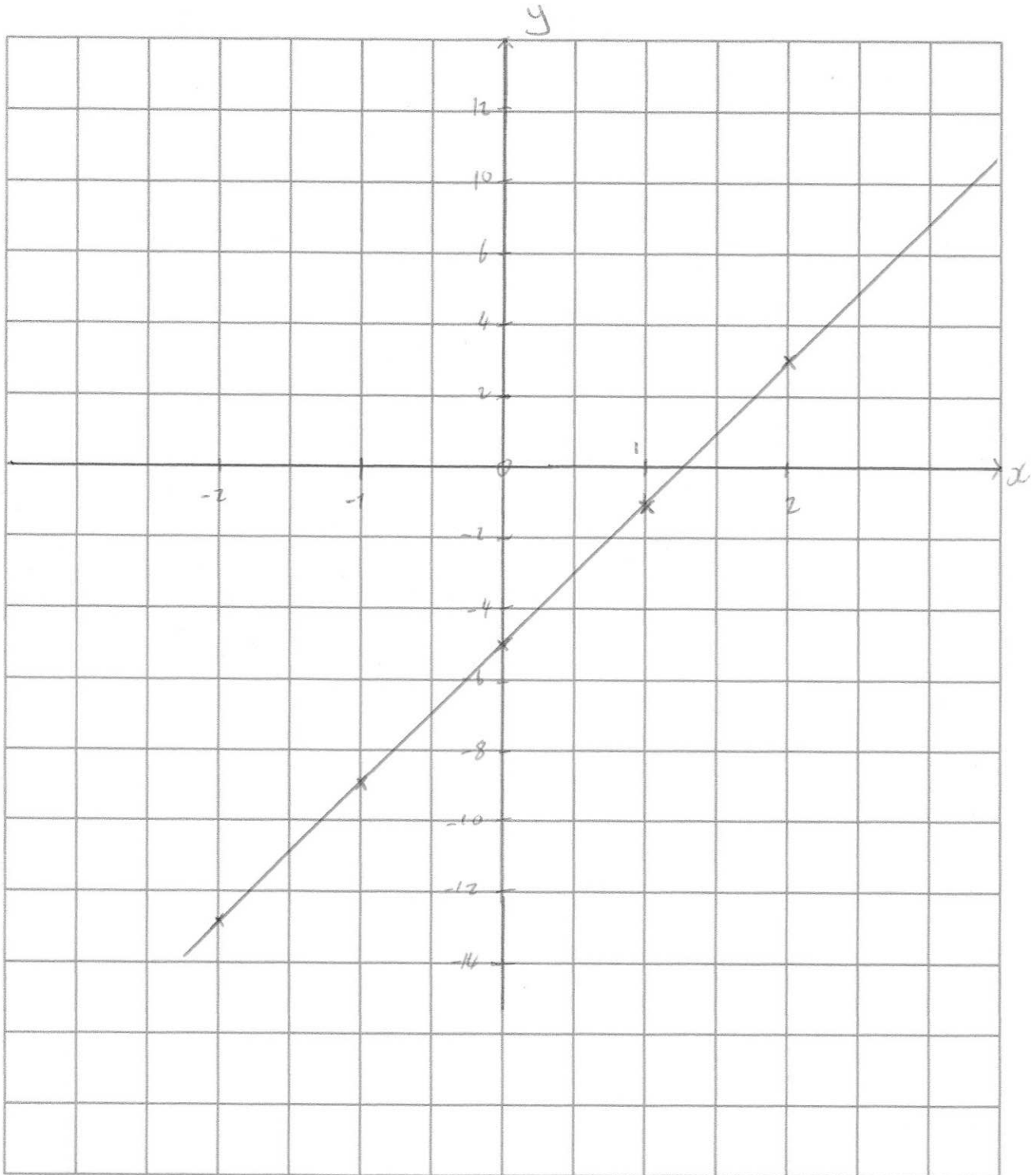
$$w(g - 1) = 5g$$

$$w = \frac{5g}{g - 1}$$

$$w = \frac{5g}{g - 1} \dots\dots\dots (3)$$

23. On the grid, draw $y = 4x - 5$ for values of x from -2 to 2 .

x	-2	-1	0	1	2
y	-13	-9	-5	-1	3



(4)

24. Solve the simultaneous equations

$$4x + 3y = 5$$

$$2x - 5y = 9 \quad \times 2$$

Do not use trial and improvement

$$\begin{array}{r} 4x + 3y = 5 \\ 4x - 10y = 18 \\ \hline 13y = -13 \\ y = -1 \end{array}$$

$$4x - 3 = 5$$

$$4x = 8$$

$$x = 2$$

check $4 - 5 = 9 \checkmark$

$$x = \dots\dots\dots 2 \dots\dots\dots y = \dots\dots\dots -1 \dots\dots\dots$$

(4)

25. Kevin is going on holiday to Japan.
He wants to change some money into yen.

The bank only stocks ¥1000 notes.
James wants to change up to £300 into yen.
He wants as many ¥1000 notes as possible.

The exchange rate is £1 = ¥168

How many ¥1000 notes should he get?

$$300 \times 168 = \text{¥} 50400$$

$$\text{Max} = \text{¥} 50000$$

50 notes

.....
(3)

26. Susan buys an antique for £120 and sells it for £216.

Work out her percentage profit

$$\frac{96}{120} = \frac{4}{5}$$

.....%
(3)

27. Charlene and Danielle share some money in ratio 7 : 9
Danielle gets £48 more than Charlene

How much does each woman receive?

$$9 - 7 = 2$$

$$48 \div 2 = 24$$

$$24 \times 7 = 168$$

$$24 \times 9 = 216$$

Charlene £.....¹⁶⁸

Danielle £.....²¹⁶

(3)

28. Natalie invests £600 for 5 years at 3% per year compound interest.
How much interest does she earn?

$$600 \times 1.03^5 = \del{600} 695.56$$

~~£~~

£.....^{95.56}

(2)

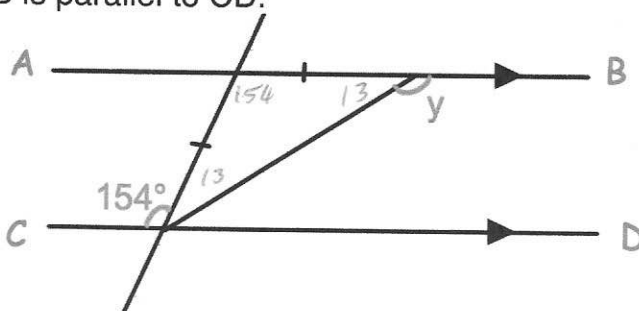
29. Nigel measures the time, t seconds, to complete a race as 14.8 seconds correct to the nearest tenth of a second.

Write down the error interval for t .

$$14.75 \leq t < 14.85$$

(2)

30. AB is parallel to CD.



Work out the size of angle y .
Give reasons for your answer.

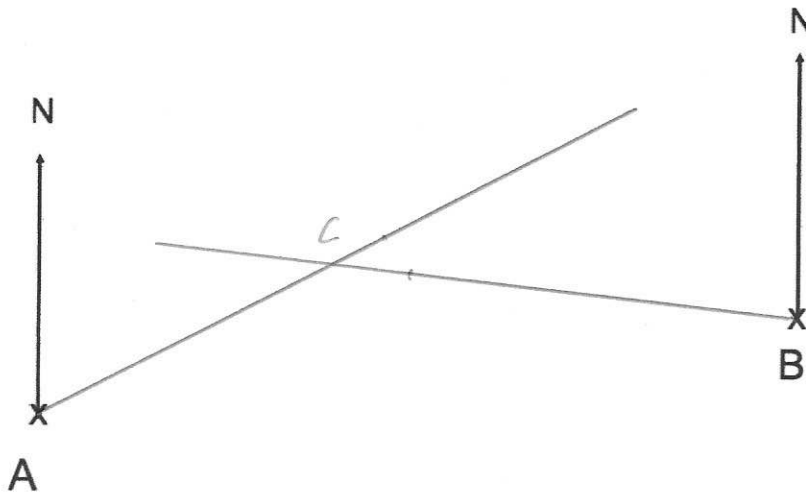
$$\begin{aligned} \angle CFE &= \angle FEG && \text{(alternate angles are equal)} \\ \angle EFG &= \angle EGF && \text{(two angles in an isosceles triangle are equal)} \\ &\text{both } 13^\circ && \end{aligned}$$

Angle EGF & BGF are in a straight line, so add to 180°

$$167^\circ$$

(4)

31. The diagram shows the position of two people, A and B, who are on their Duke of Edinburgh expedition.



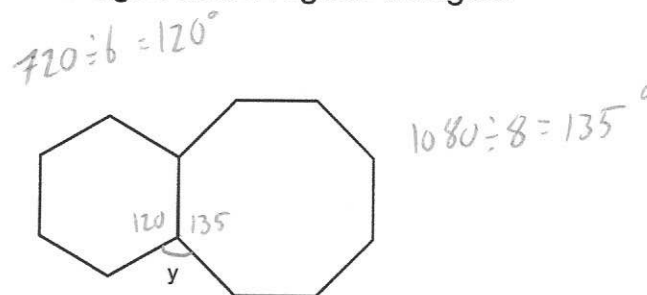
The bearing of person C from person A is 062°

The bearing of person C from person B is 275°

In the space above, mark the position of person C with a cross (x). Label it C.

(3)

32. Shown is a regular hexagon and a regular octagon.



Calculate the size of angle y.

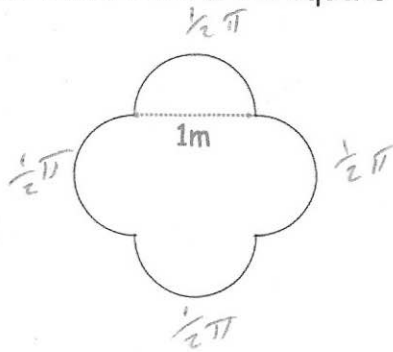
$$120 + 135 = 255$$

$$360 - 255 = 105^\circ$$

$$y = \dots\dots\dots 105 \dots\dots\dots^\circ$$

(3)

33. Shown is a table top.
It is made from a 1m square and four semicircles.



$$\pi \times 1 = \pi$$

$$\pi \div 2 = \frac{1}{2} \pi$$

Calculate the perimeter of the table top.

$$\dots\dots\dots \frac{2\pi}{\dots\dots\dots} \text{m}$$

or 6.28 (4)

34. Work out $\sqrt{125} = 5$ $2^{-3} = \frac{1}{2^3} = \frac{1}{8}$

$$125^{1/3} \times 2^{-3}$$

$$5 \times \frac{1}{8}$$

$$\dots\dots\dots \frac{5}{8} \dots\dots\dots$$

(2)

35. Jacob buys a watch costing £84
This cost includes VAT at a rate of 20%.

How much is the watch without VAT?

$$120\% = 84.00$$

$$1\% = 0.70$$

$$100\% = 70$$

$$\pounds \dots\dots\dots 70 \dots\dots\dots$$

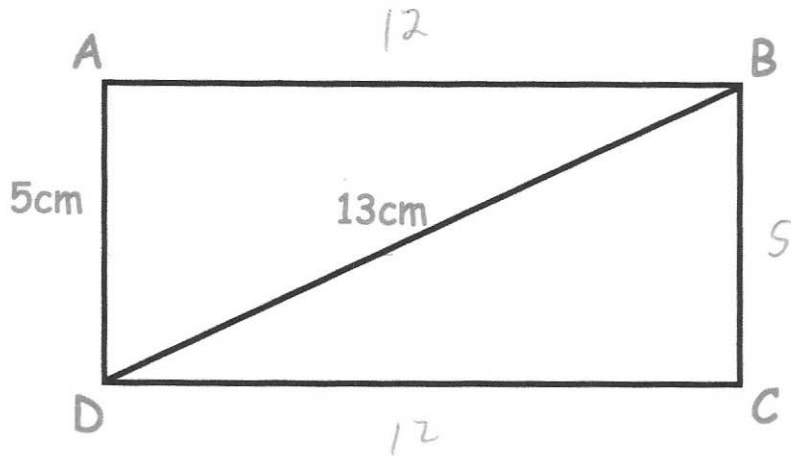
(3)

36. Expand and simplify $(x - 5)(x - 2)(x - 1)$

$$\begin{aligned} & (x^2 - 2x - 5x + 10)(x - 1) \\ & (x^2 - 7x + 10)(x - 1) \\ & x^3 - x^2 - 7x^2 + 7x + 10x - 10 \end{aligned}$$

$$\begin{aligned} & x^3 - 8x^2 + 17x - 10 \\ & \dots\dots\dots \end{aligned} \quad (4)$$

37. Below is rectangle, ABCD



AD = 5cm
BD = 13cm

Calculate the perimeter of rectangle ABCD

$$\begin{aligned} 5^2 + y^2 &= 13^2 \\ 25 + y^2 &= 169 \\ y^2 &= 144 \\ y &= 12 \end{aligned}$$

$$\begin{aligned} & 5 + 12 + 5 + 12 \\ & \dots\dots\dots 34 \text{ cm} \\ & \dots\dots\dots \end{aligned} \quad (3)$$

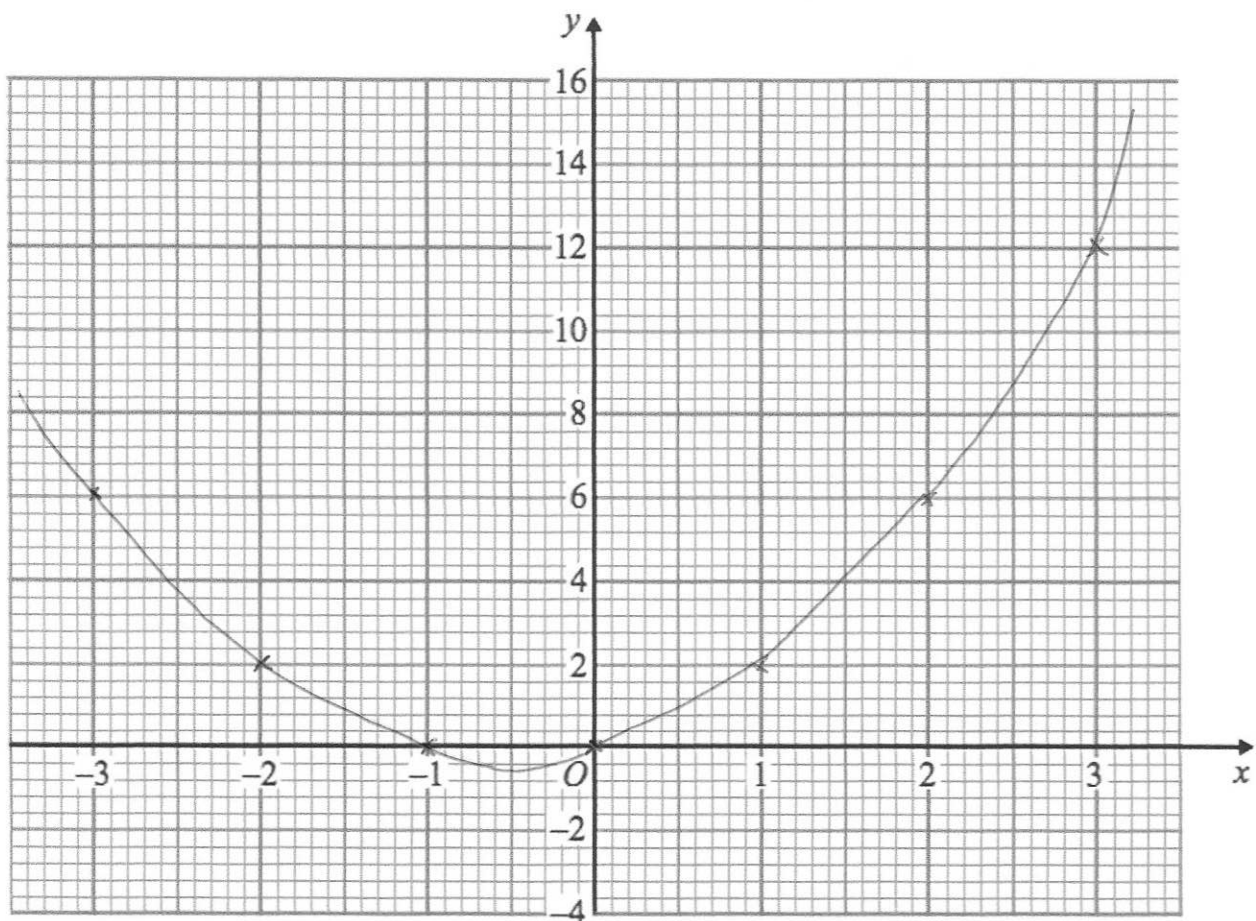
38

101. (a) Complete the table of values for $y = x^2 + x$

x	-3	-2	-1	0	1	2	3
y	6	2	0	0	2	6	12

(2)

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



(2)

39. A circle has an area of $64\pi \text{ cm}^2$

Work out the radius of the circle.

$$A = 64\pi$$

$$r^2 = 64$$

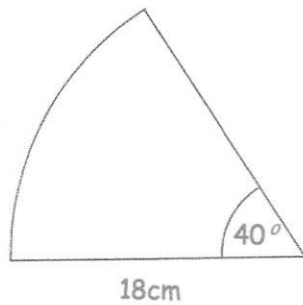
$$r = 8$$

8

.....cm

(2)

40.



Find the length of the arc, giving your answer to 1 decimal place.

$$\frac{40}{360} \times \pi \times 36$$

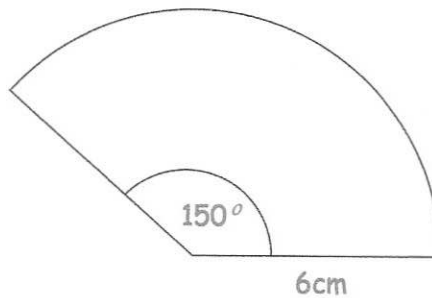
$$\frac{1}{9} \times \pi \times 36 = 4\pi$$

12.6

.....cm

(3)

41. Shown is a sector of a circle.



Find the area of the sector.

$$\frac{150}{360} \times \pi \times 6^2$$

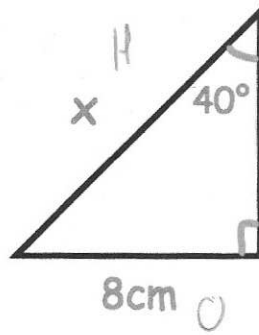
$$= 15\pi$$

47.1

.....cm²

(3)

42. The diagram shows a right-angled triangle.



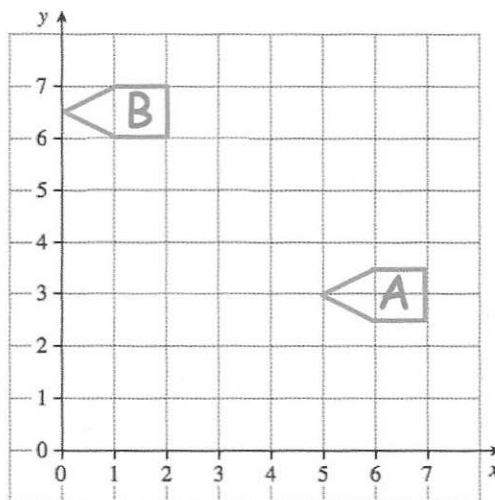
$\sin 40^\circ$

Calculate the length of x.

$$x = \frac{8}{\sin 40}$$

.....^{to 2dp} 12.45 cm
(3)

43.

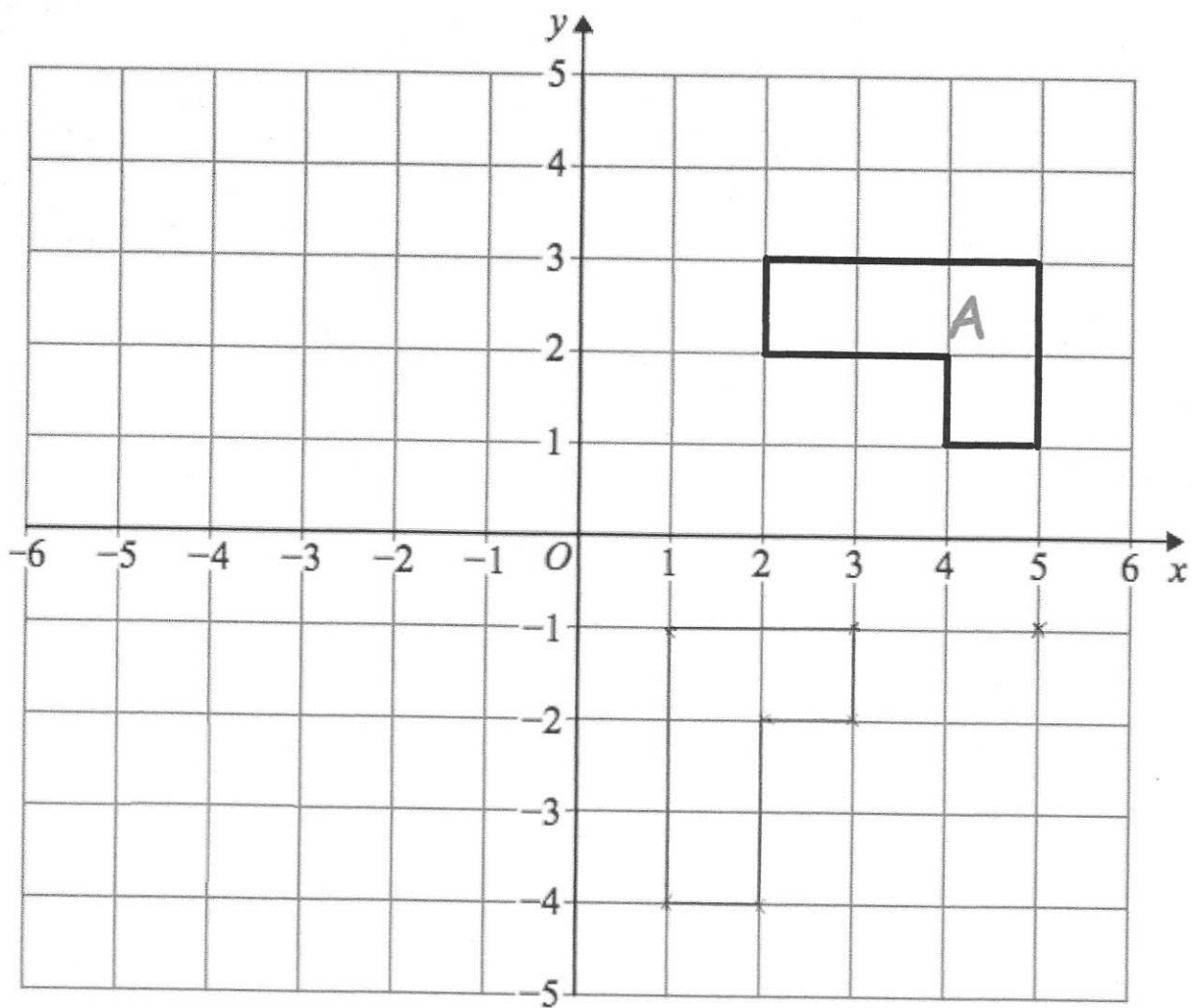


Describe fully the single transformation that maps shape A onto shape B.

..... Translation by the vector $\begin{pmatrix} -5 \\ 3.5 \end{pmatrix}$

(2)

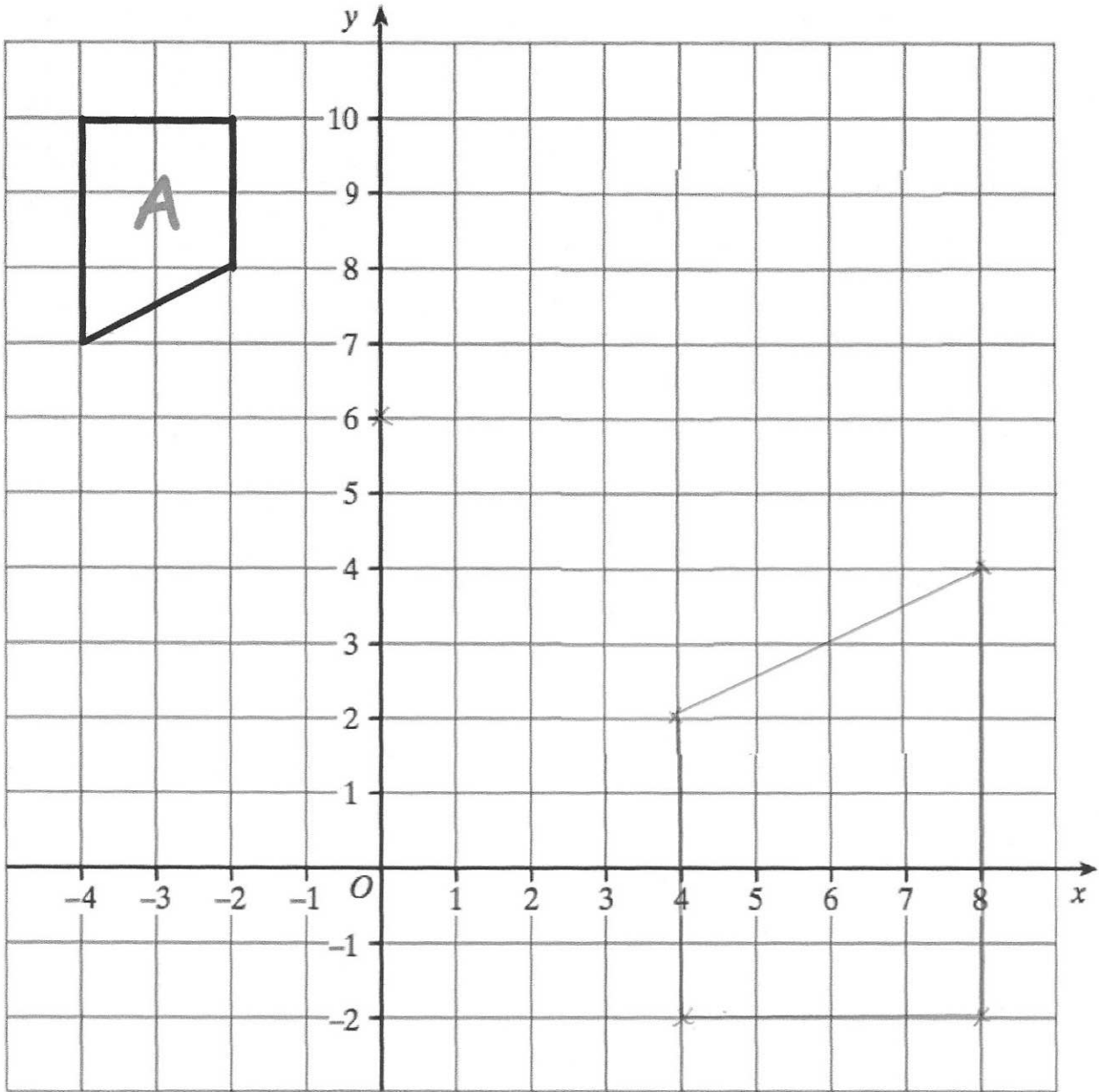
44.



Rotate shape A 90° anti-clockwise about centre (5, -1)

(3)

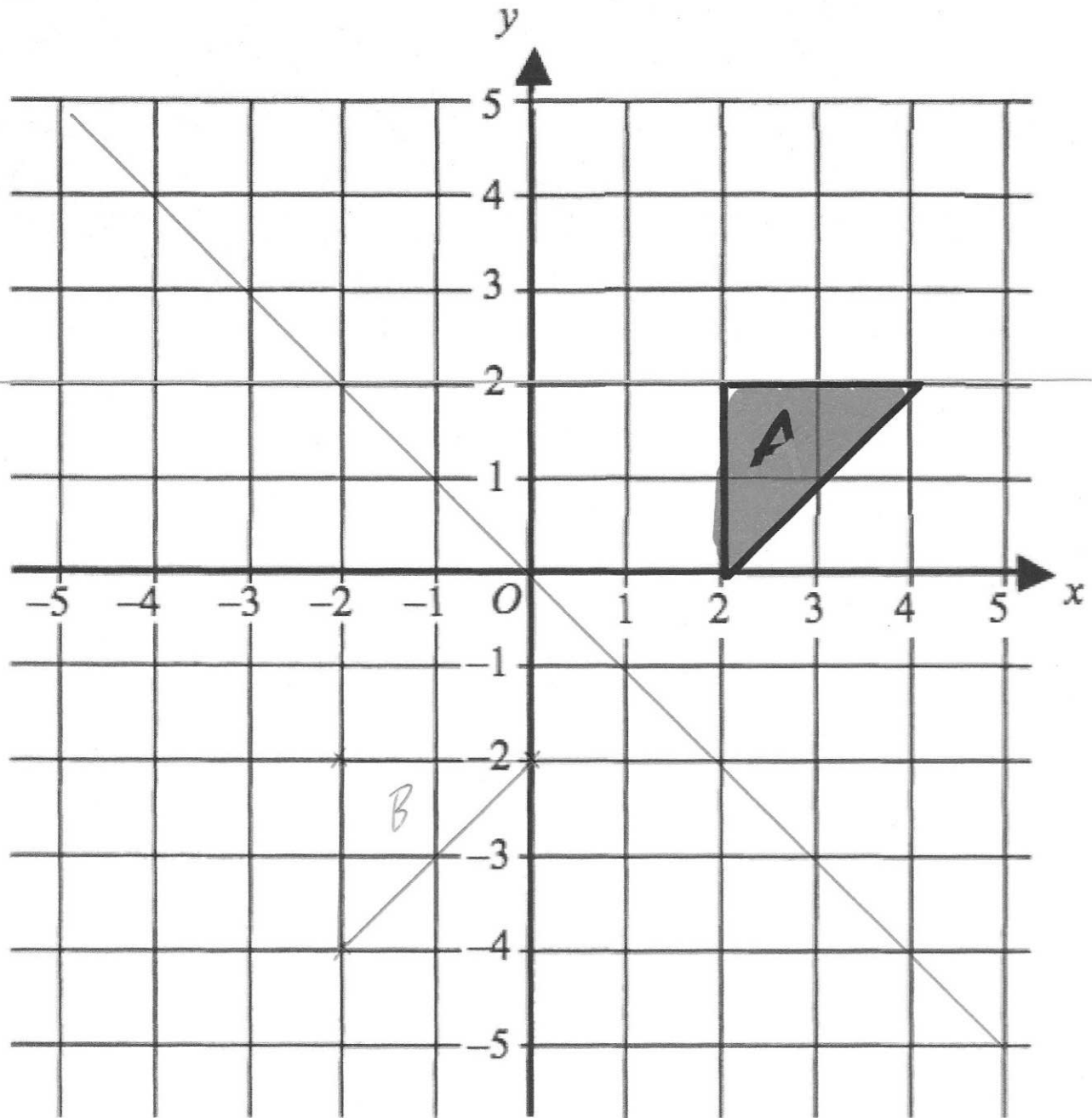
45.



Enlarge the triangle by scale factor -2 , using centre of enlargement $(0, 6)$

(3)

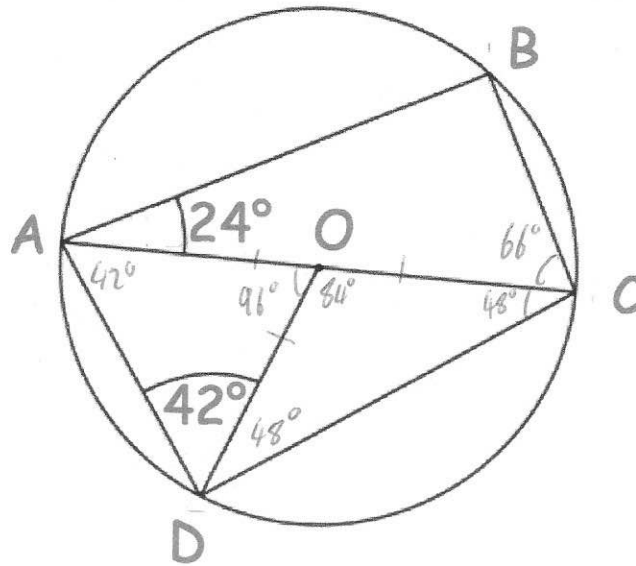
46.



Reflect the triangle in the line $y = -x$
Label the new triangle B.

(2)

47.



In the diagram O is the centre of the circle.
 AOC is a straight line.
 Angle BAO is 24° and Angle ADO is 42°

(a) Find the size of angle CAD.

$$\underline{\quad 42^\circ \quad} \quad (1)$$

(b) Find the size of angle ACB.

$$180 - 24 - 90$$

$$\underline{\quad 66^\circ \quad} \quad (1)$$

(c) Find the size of angle BCD.

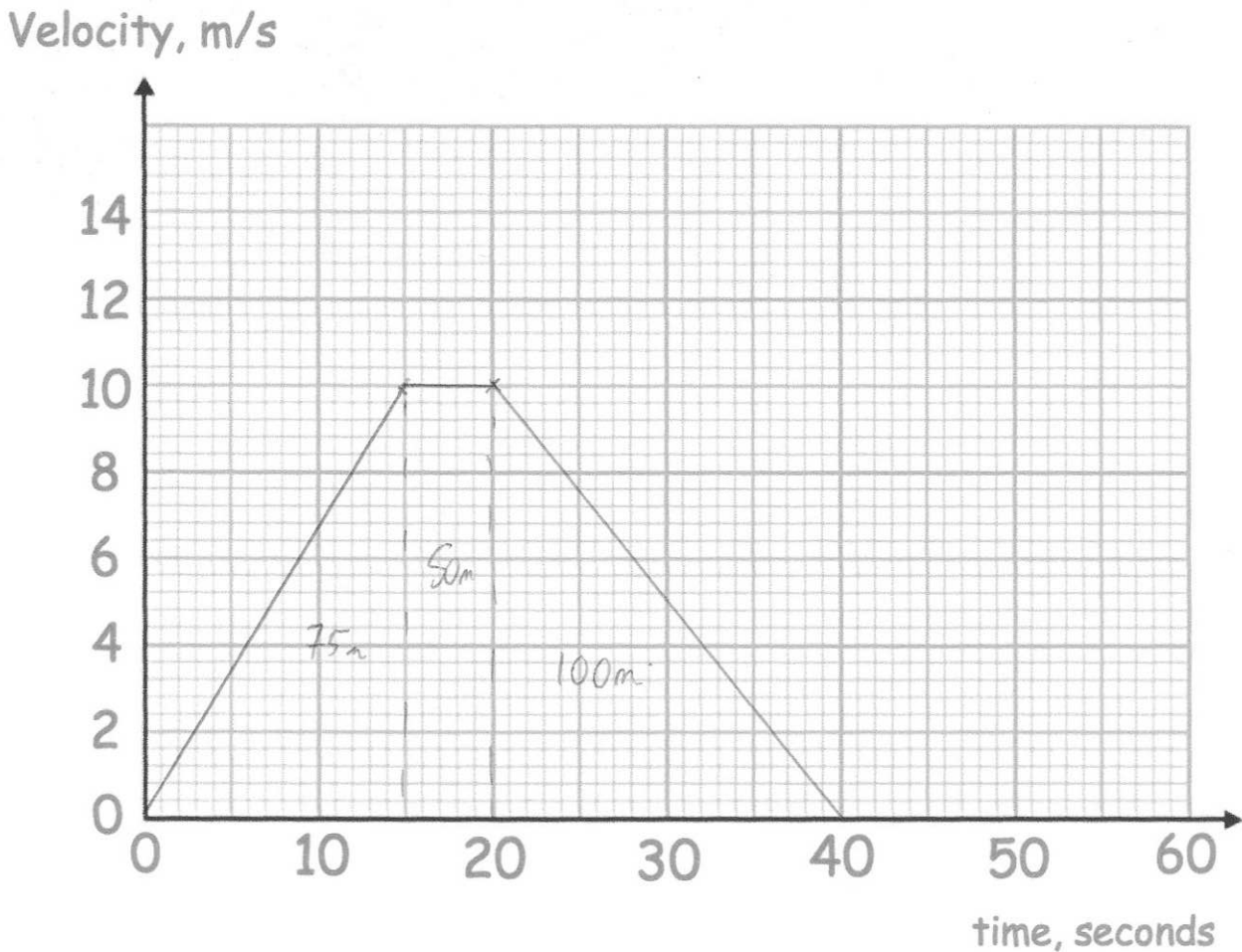
$$\begin{array}{r} 42 \\ + 24 \\ \hline 66 \end{array}$$

$$\begin{array}{r} 180 \\ - 66 \\ \hline 114 \end{array}$$

$$\underline{\quad 114^\circ \quad} \quad (1)$$

48. A remote control car drives in a straight line.
 It starts from rest and travels with constant acceleration for 15 seconds reaching a velocity of 10m/s.
 It then travels at a constant speed for 5 seconds.
 It then slows down with constant deceleration of 0.5m/s^2 .

(a) Draw a velocity time graph



(b) Using your velocity-time graph, work out the total distance travelled.

.....225.....m
 (2)

49.



$$t = \frac{d}{s}$$

A village is 20 miles from Belfast.

Conor drives from the village to Belfast at 40mph
 Kelly drives from the village to Belfast at 50mph

30 minutes

Work out how much longer the journey takes Conor.
 Give your answer in minutes.

Kelly

$$\frac{20}{50} = 0.4 \text{ hours}$$

$$24 \text{ minutes}$$

$$30 - 24$$

.....6.....minutes
(3)

50. The mass of 3m^3 of tin is 21840kg.

(a) Work out the density of tin.

$$\frac{m}{v}$$

$$\frac{21840}{3}$$

.....7280.....kg/m³
(2)

The density of aluminium is 2712kg/m³. $\times 5 = 13560$

(b) Work out the difference in mass between 5m^3 of tin and 5m^3 of aluminium.

$$\text{tin } 7280 \times 5 = 36400$$

$$\begin{array}{r} 36400 \\ 13560 \\ \hline 22840 \end{array}$$

.....22840.....kg
(3)