GCSE Revision - A BIT OF EVERYTHING

AQA

Higher

Corbettmaths

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

Guidance

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

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1. Work out

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

Give your answer as a fraction.

.....

(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?

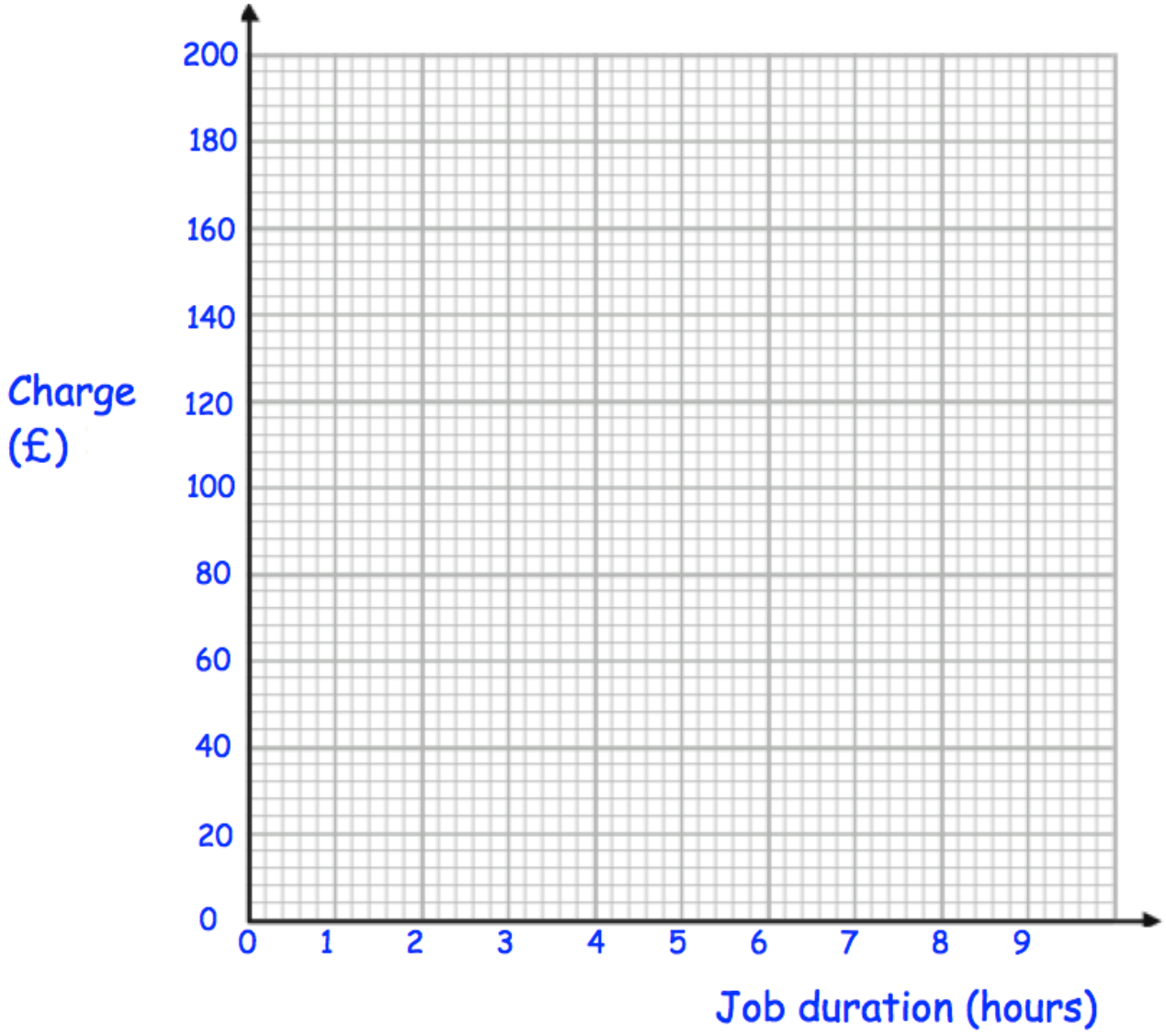
(4)

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.

.....

.....

(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.

£.....

(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.

.....

.....

(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.

.....

(1)

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

.....

(1)

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

.....

(2)

5. Work out

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

Give your answer as a mixed number.

.....

(3)

---

6. Work out

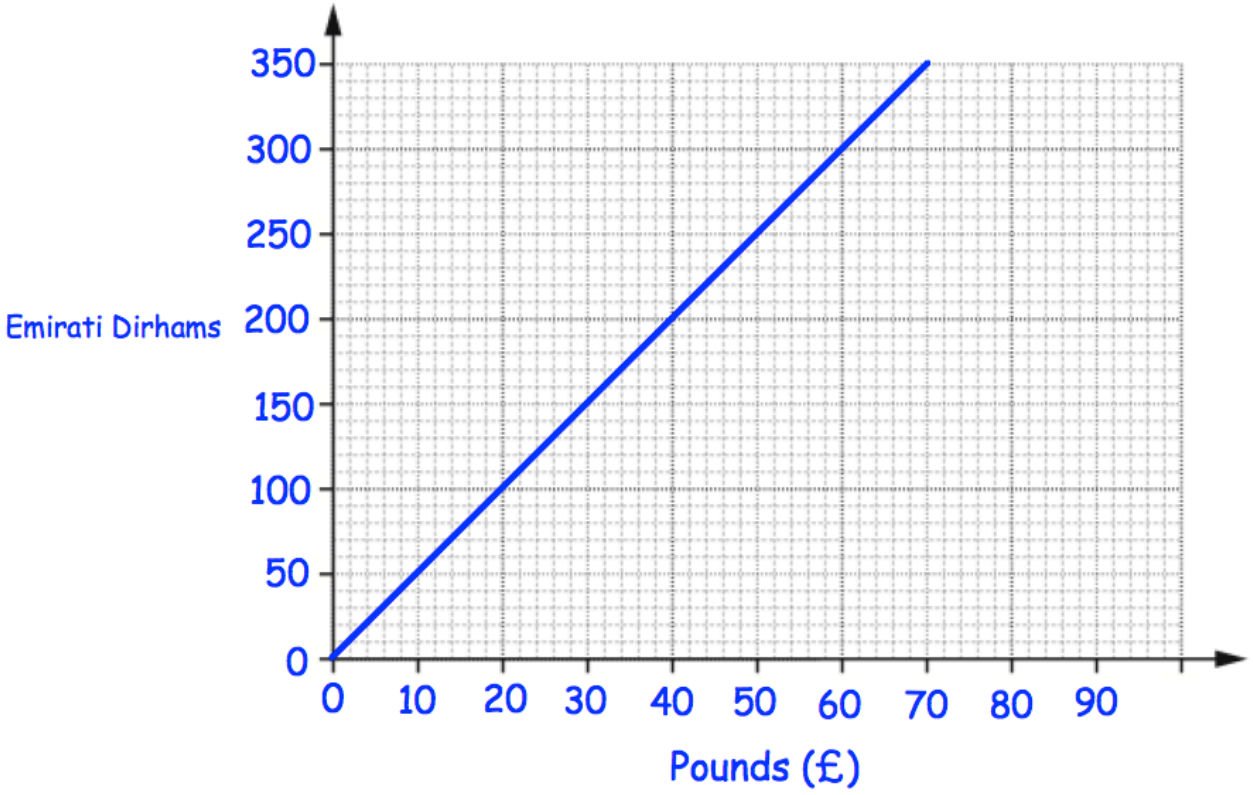
$$\frac{2}{17} \div \frac{2}{5}$$

Give your answer as a fraction in its simplest form.

.....

(2)

7.



(a) Convert £50 into Dirhams.

.....Dirhams
(1)

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

£.....
(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.

City:..... £.....
(1)

8. Use approximations to estimate the value of

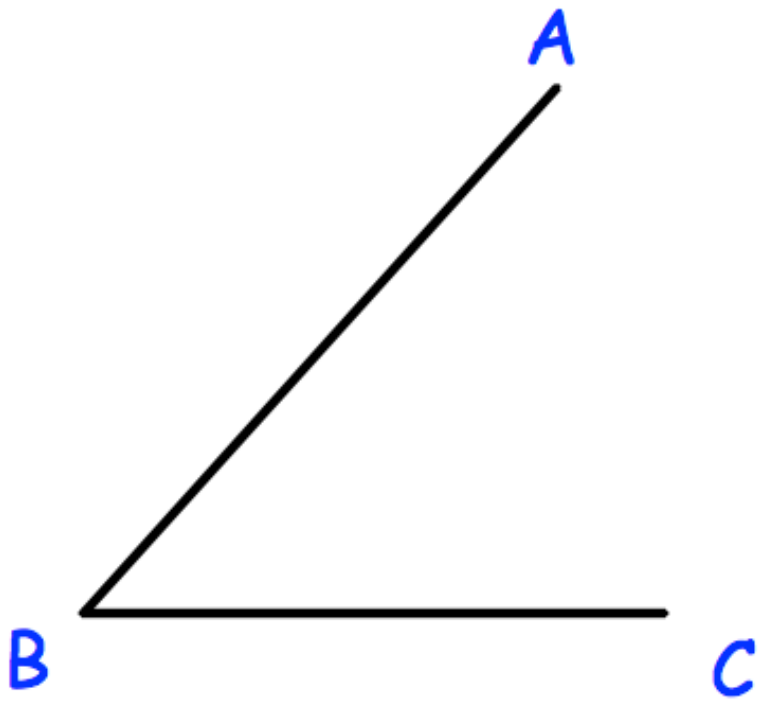
$$\frac{4.12 \times 1.89}{0.21}$$

.....

(3)

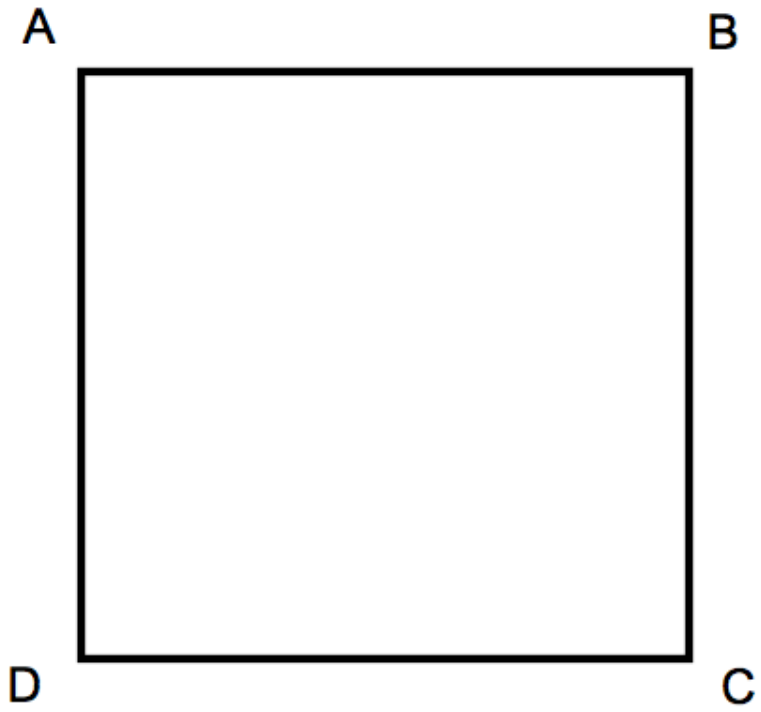
---

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



(2)

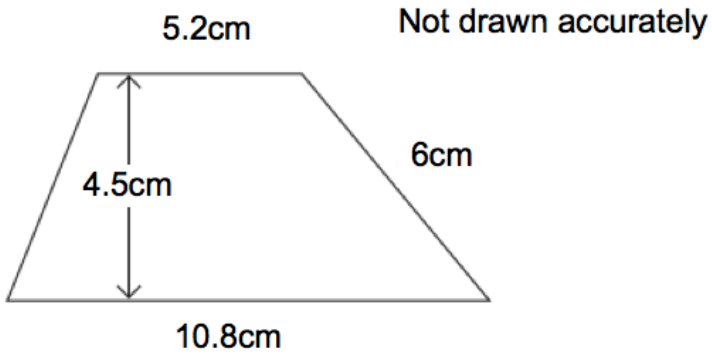
10. A and B are two points.



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

(3)

11.

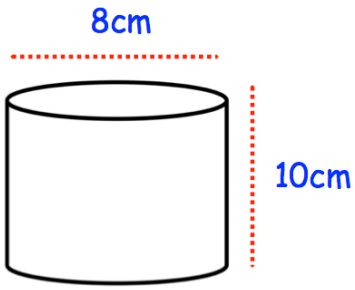


Calculate the area of the trapezium.

.....cm²

(2)

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

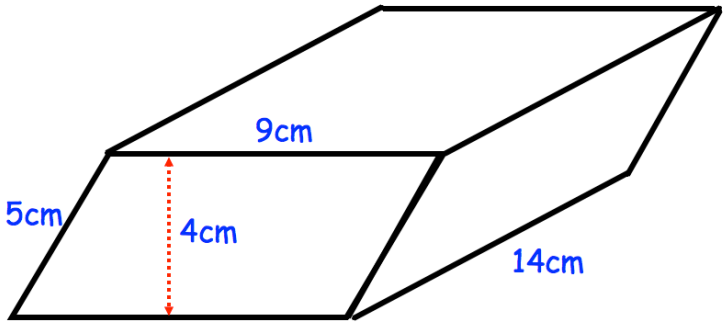


Find the volume of the cylinder.
Give your answer in terms of π

..... cm³

(3)

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



Find the volume of the prism.

.....cm³

(3)

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

The total amount of money they have is 75 pence.

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

.....

(2)

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

.....pence

(2)

15. On a particular day, 98 adults 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.

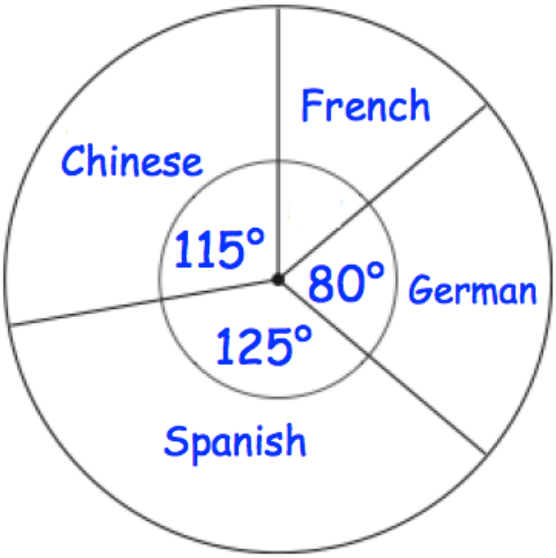
51 people are male.
21 out of the 40 going to the gym are male.
19 males and 7 females are going swimming.
7 out of the 20 people playing badminton are male.
Twice as many females play tennis than males.

How many women play tennis?

.....

(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?

.....

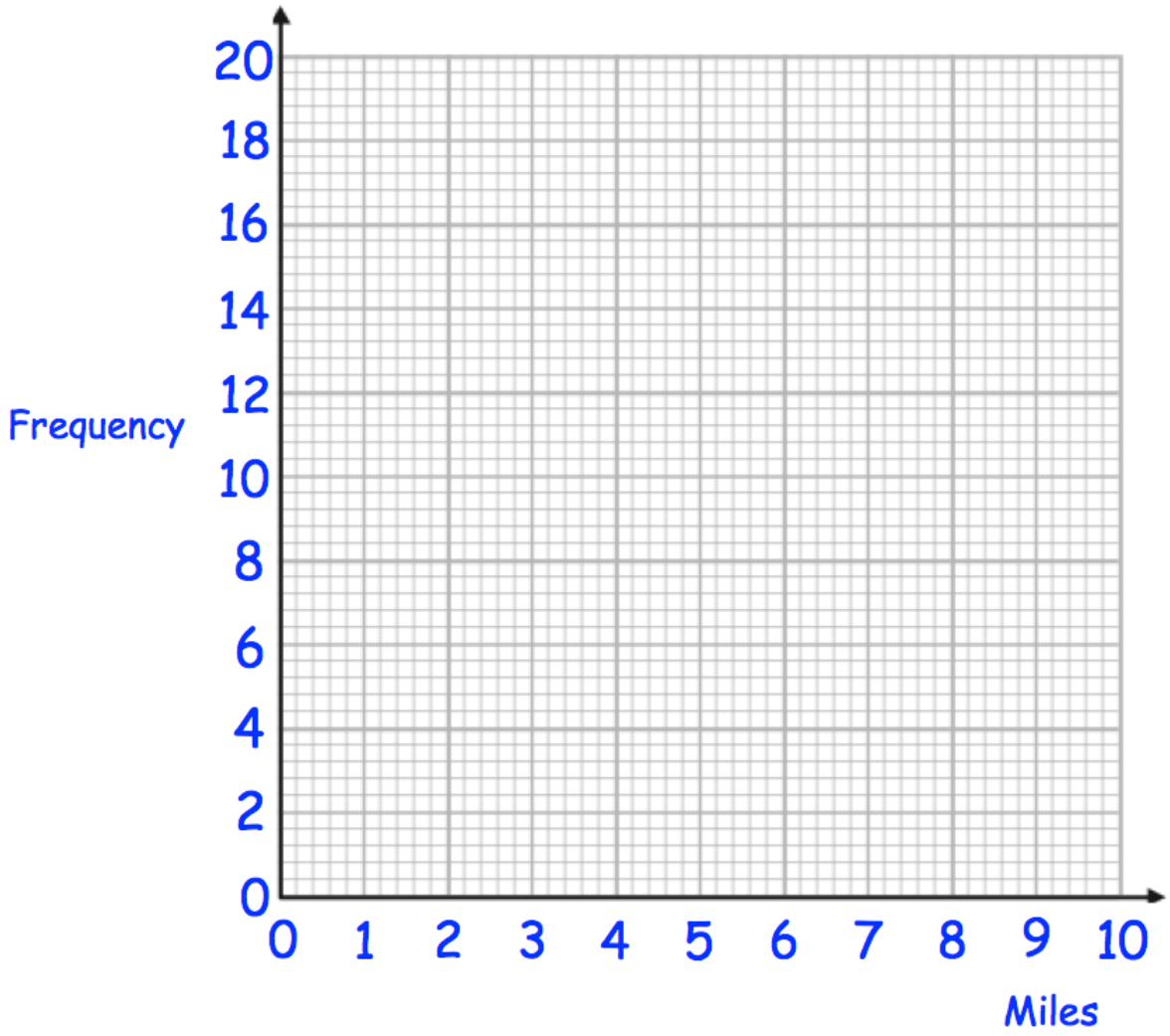
(4)

17. The table shows the distance travelled to school by 50 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.

.....

(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?

..... and .....

(2)

19. Simplify

$(2m^4)^3$

.....

(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?

.....

(3)

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

Work out the value of

$$\frac{ab + 24}{2c}$$

.....

(3)

---

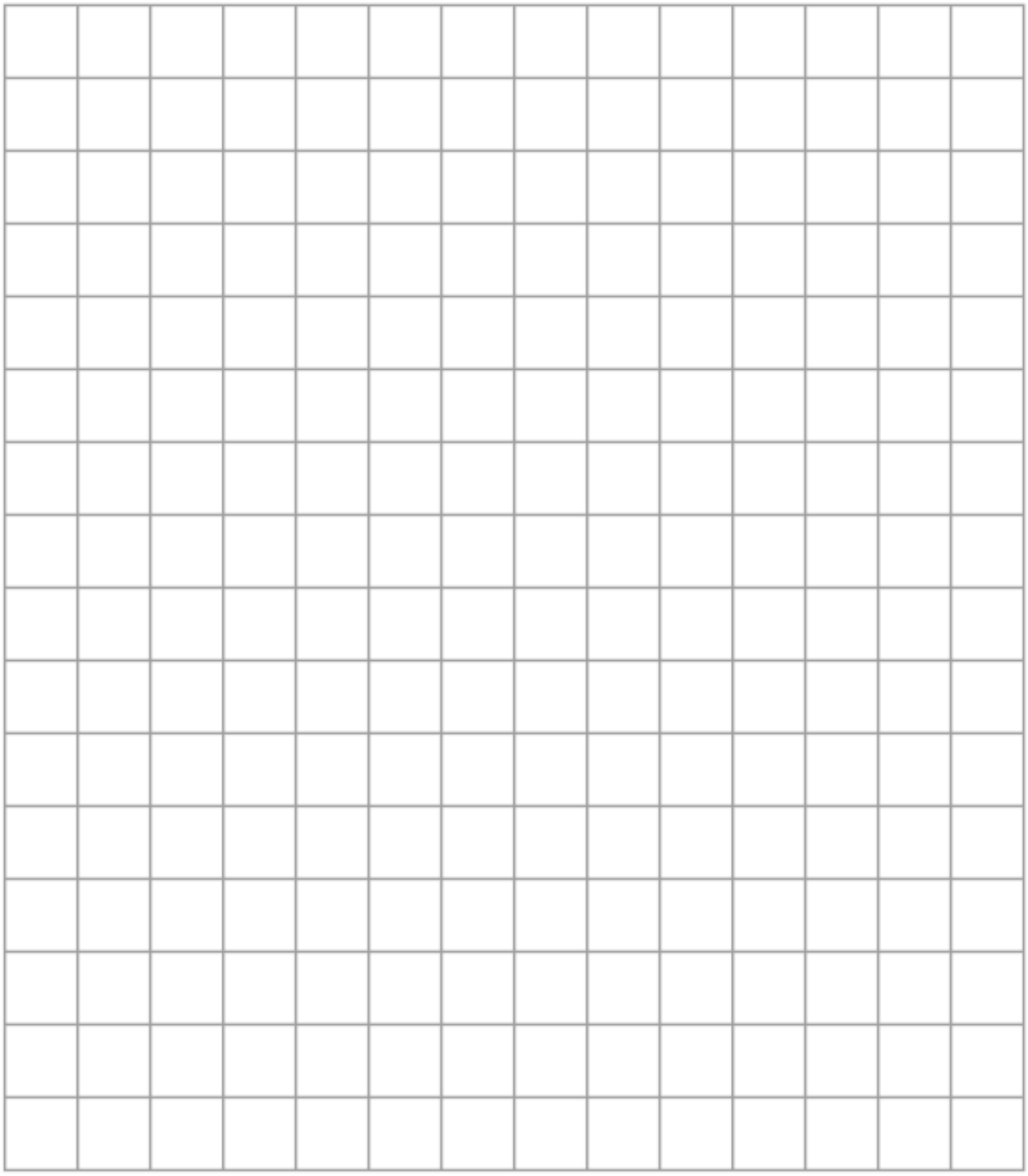
22. Make w the subject of the formula

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

w = ...

(3)

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



(4)

24. Solve the simultaneous equations

$4x + 3y = 5$
$2x - 5y = 9$

Do not use trial and improvement

x = ... y = ...

(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?

.....

(3)

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

Work out her percentage profit

.....%

(3)

---

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

How much does each woman receive?

Charlene £.....

Danielle £.....

(3)

---

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

£.....

(2)

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

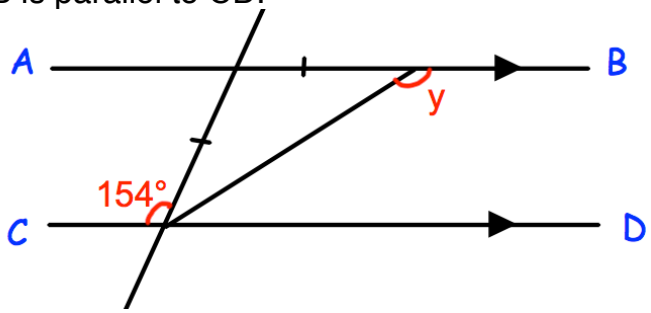
Write down the error interval for t.

.....

(2)

---

30. AB is parallel to CD.



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

.....°

(4)

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

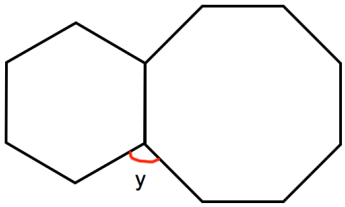
The bearing of person C from person A is 062^0
The bearing of person C from person B is 275^0

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.

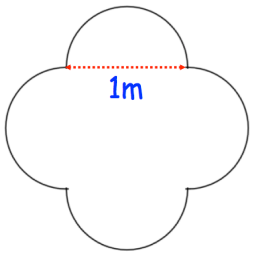


Calculate the size of angle y.

y = ...^{0}

(3)

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



Calculate the perimeter of the table top.

.....m
(4)

---

34. Work out

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

.....
(2)

---

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

How much is the watch without VAT?

£.....
(3)

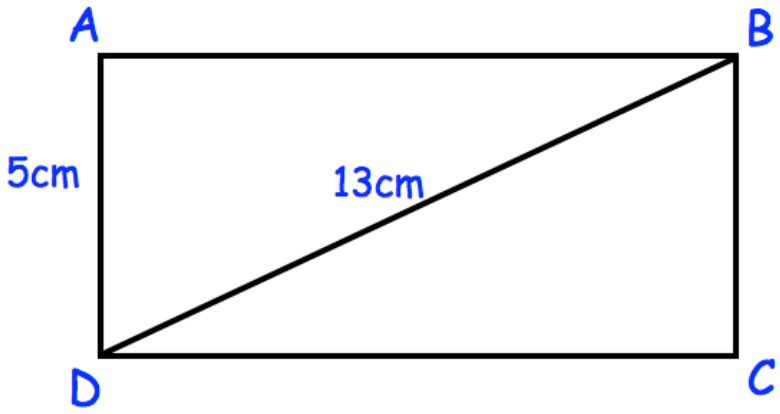
36. Expand and simplify $(x - 5)(x - 2)(x - 1)$

.....

(4)

---

37. Below is rectangle, ABCD



AD = 5cm
BD = 13cm

Calculate the perimeter of rectangle ABCD

.....cm

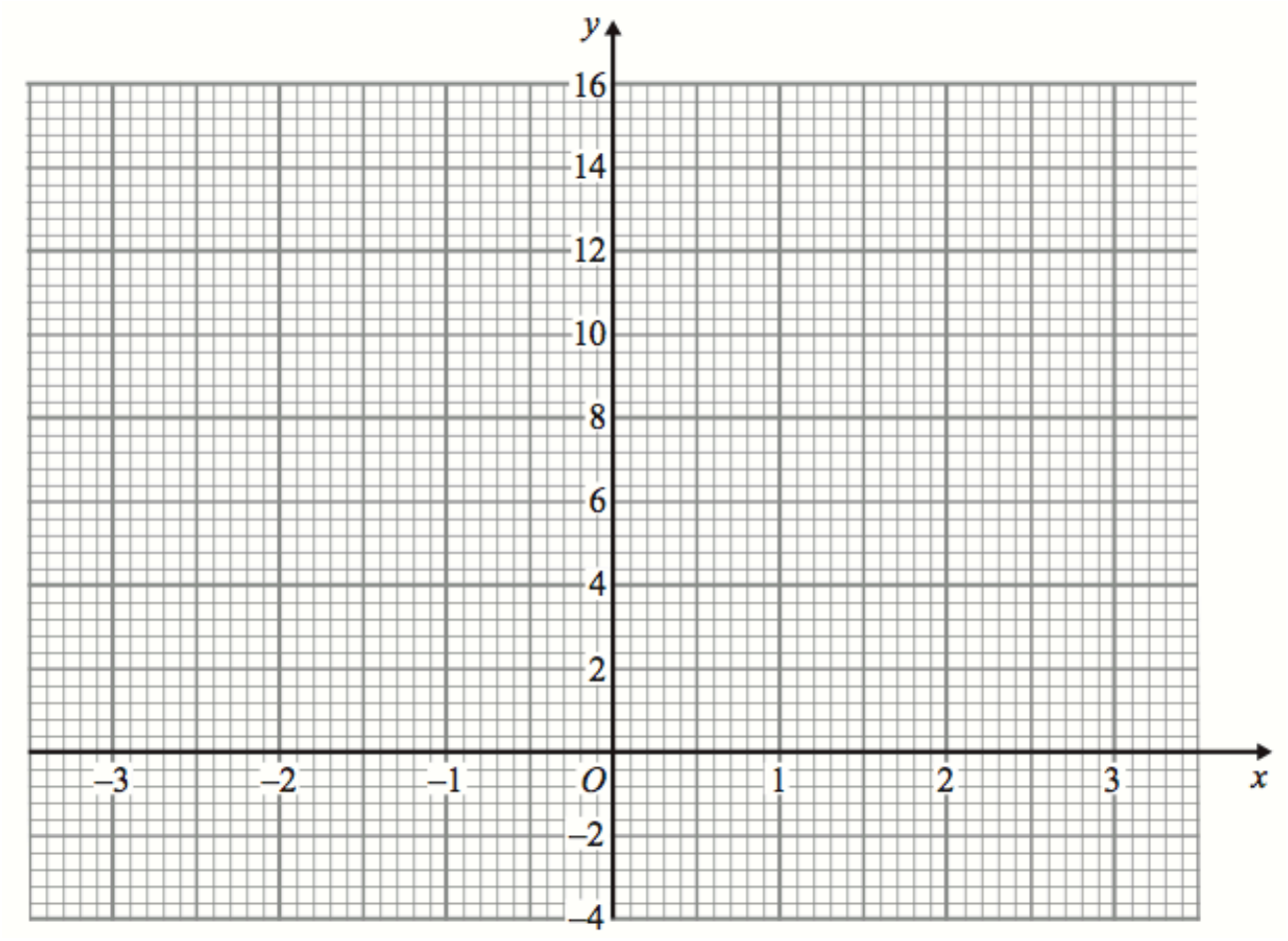
(3)

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

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

(2)

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



(2)

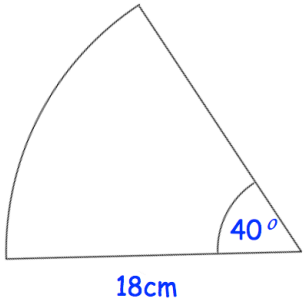
39. A circle has an area of 64π cm²

Work out the radius of the circle.

.....cm

(2)

40.



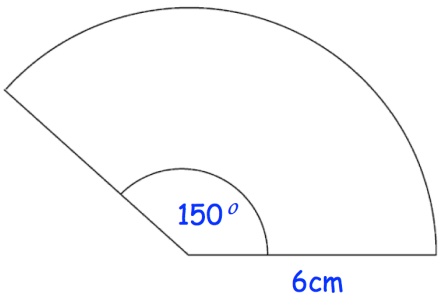
Find the length of the arc, giving your answer to 1 decimal place.

.....cm

(3)

---

41. Shown is a sector of a circle.

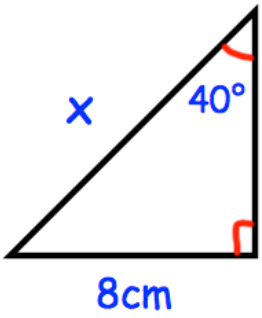


Find the area of the sector.

.....cm²

(3)

42. The diagram shows a right-angled triangle.

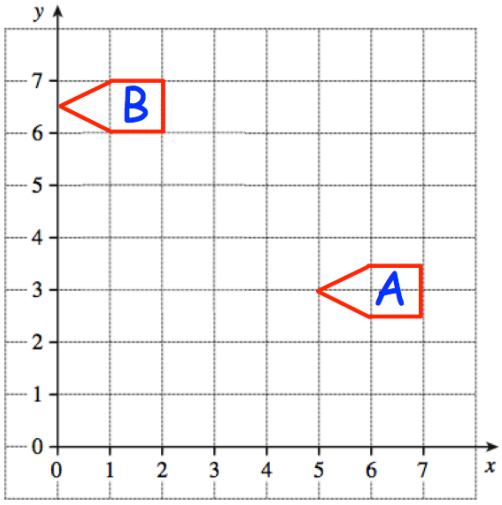


Calculate the length of x.

.....cm

(3)

43.



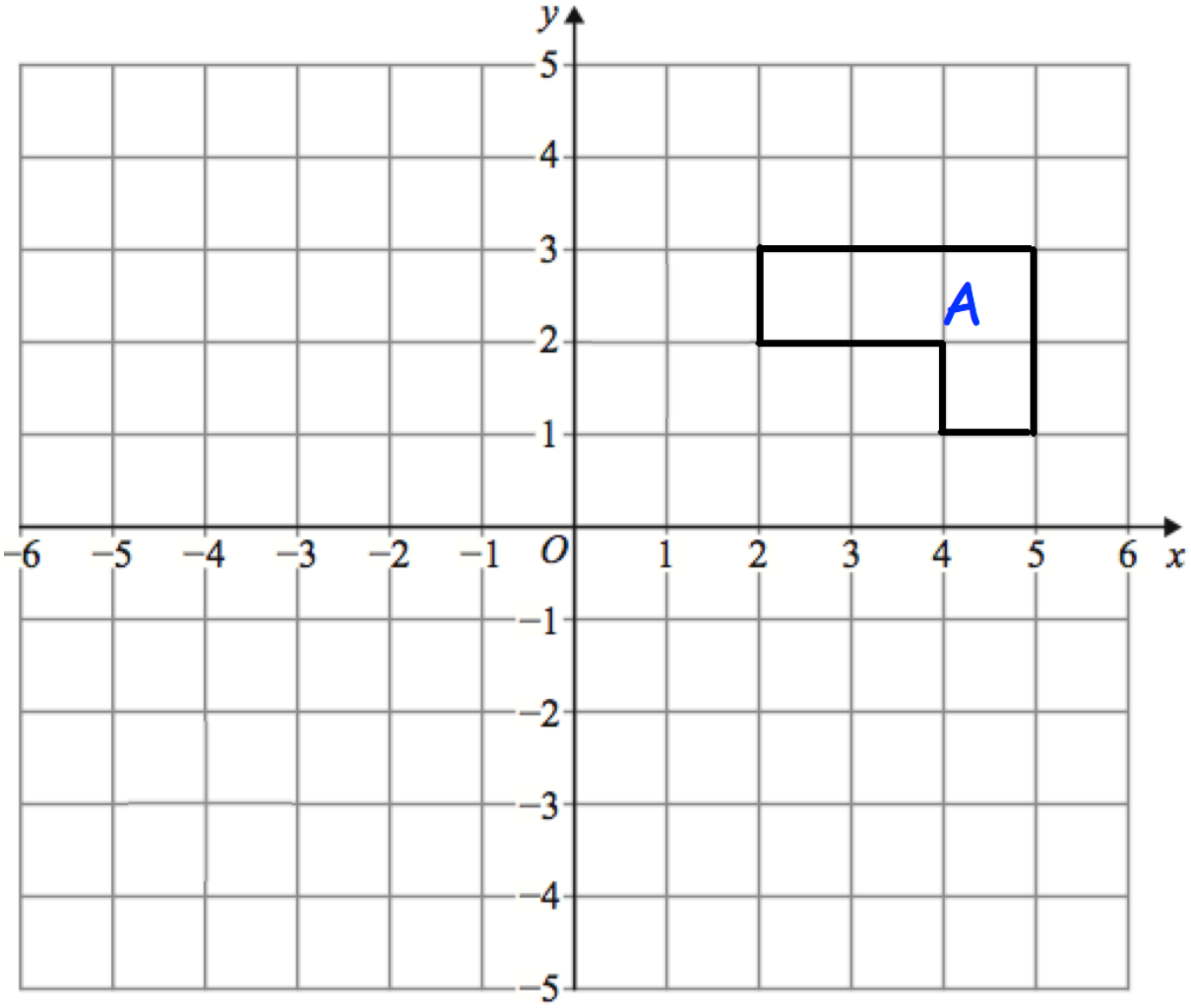
Describe fully the single transformation that maps shape A onto shape B.

.....

.....

(2)

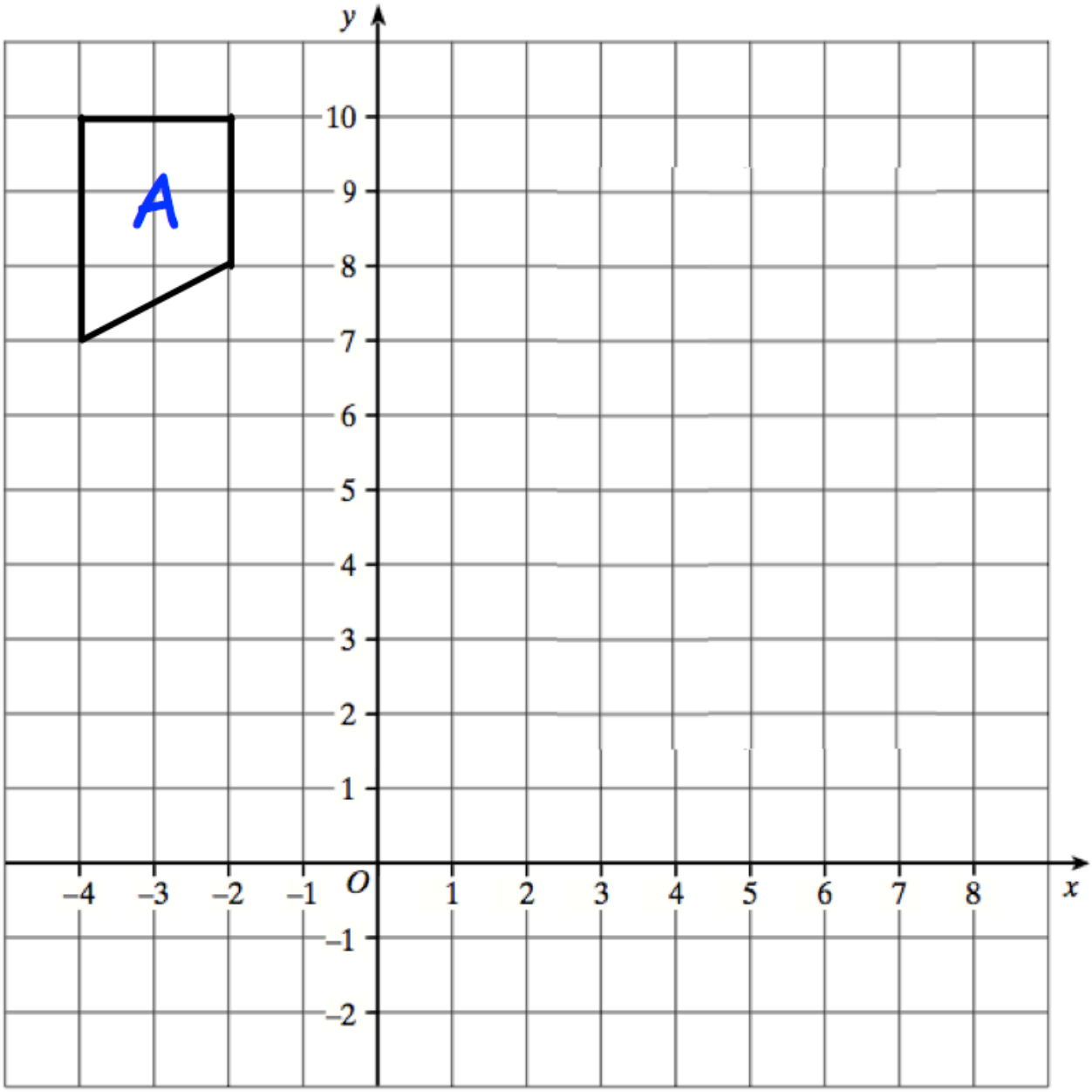
44.



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

(3)

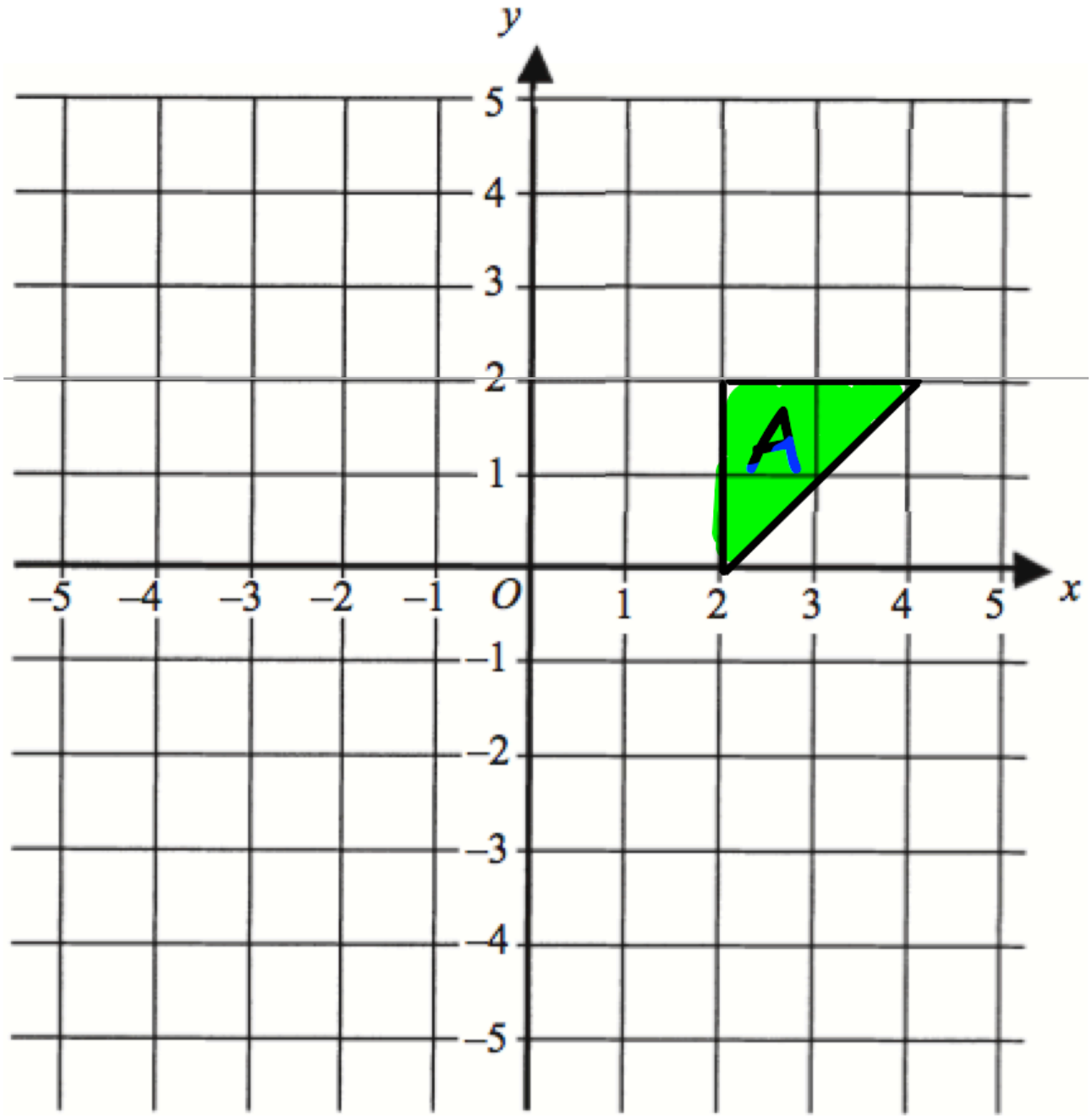
45.



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

(3)

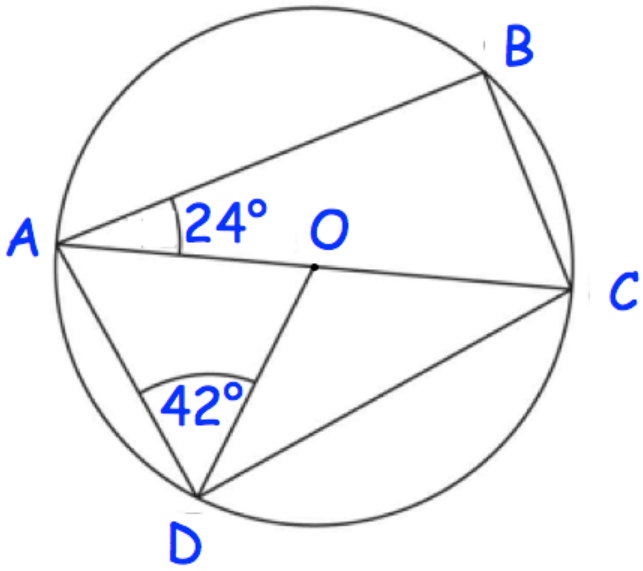
46.



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.

.....°

(1)

(b) Find the size of angle ACB.

.....°

(1)

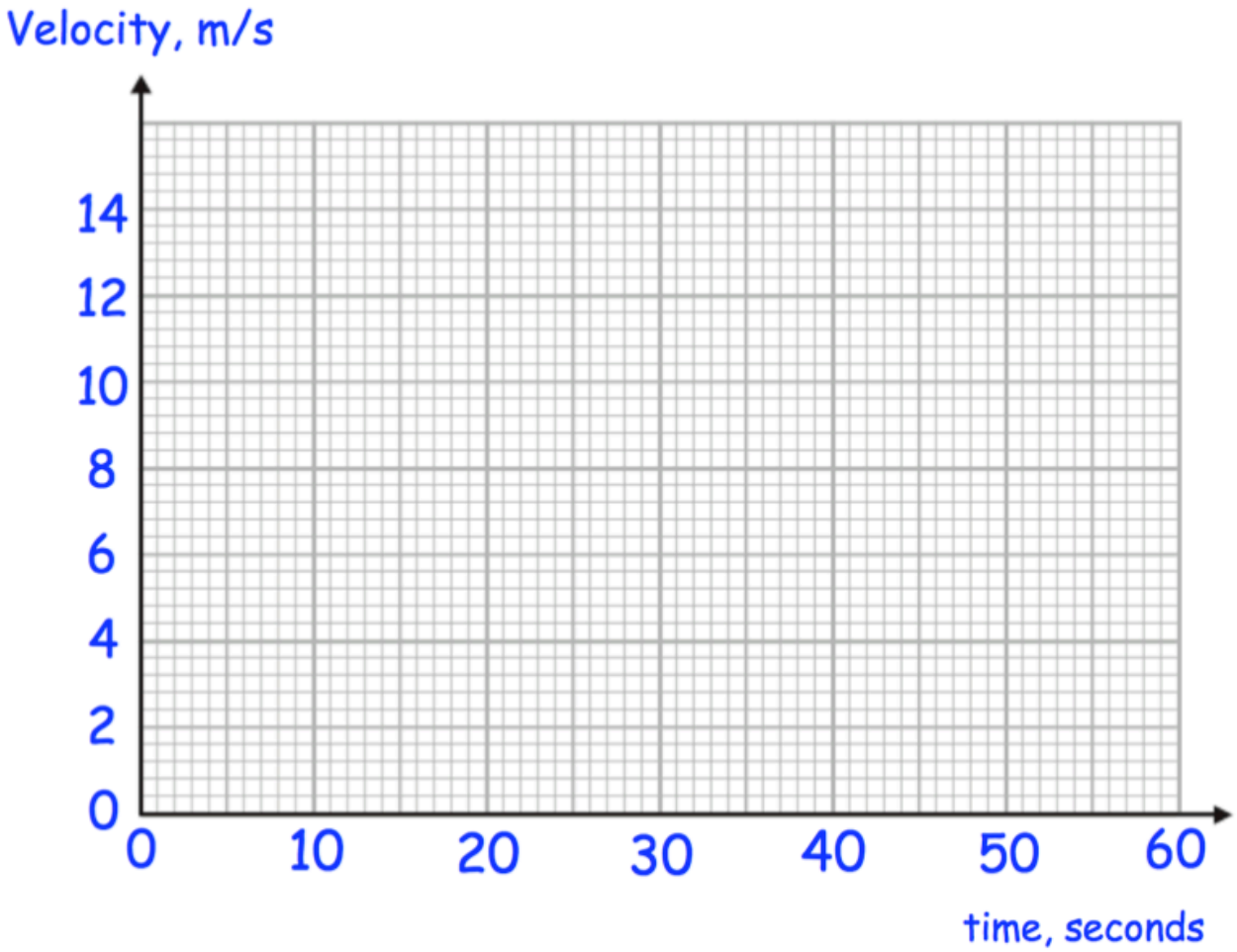
(c) Find the size of angle BCD.

.....°

(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.

……..m
(2)

49.

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

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

.....minutes
(3)

---

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

(a) Work out the density of tin.

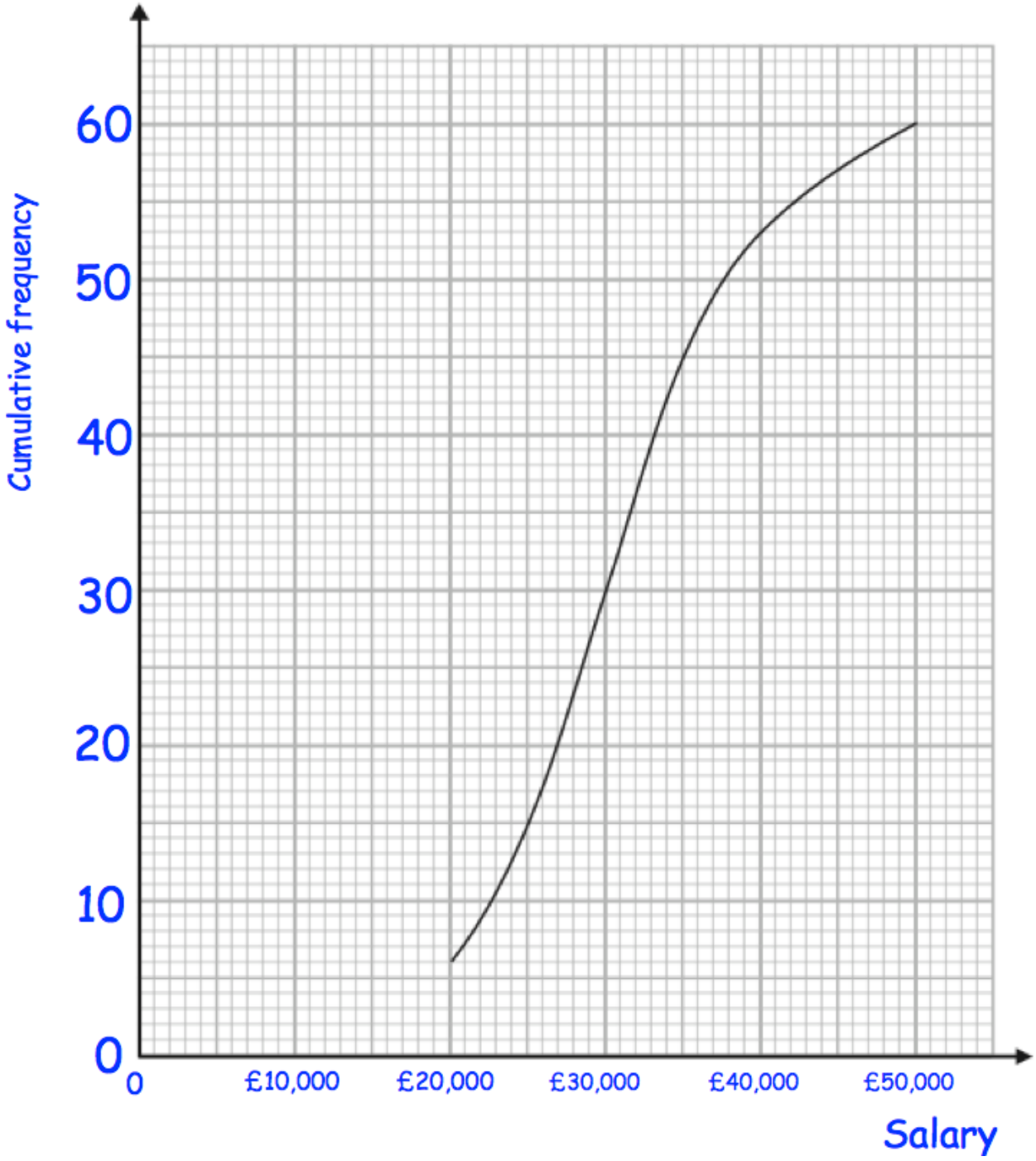
……..kg/m^3
(2)

The density of aluminium is 2712kg/m^3.

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

……..kg
(3)

51. A university surveyed 60 mathematics graduates on their starting salary.
The cumulative frequency graph shows some information about the salaries.



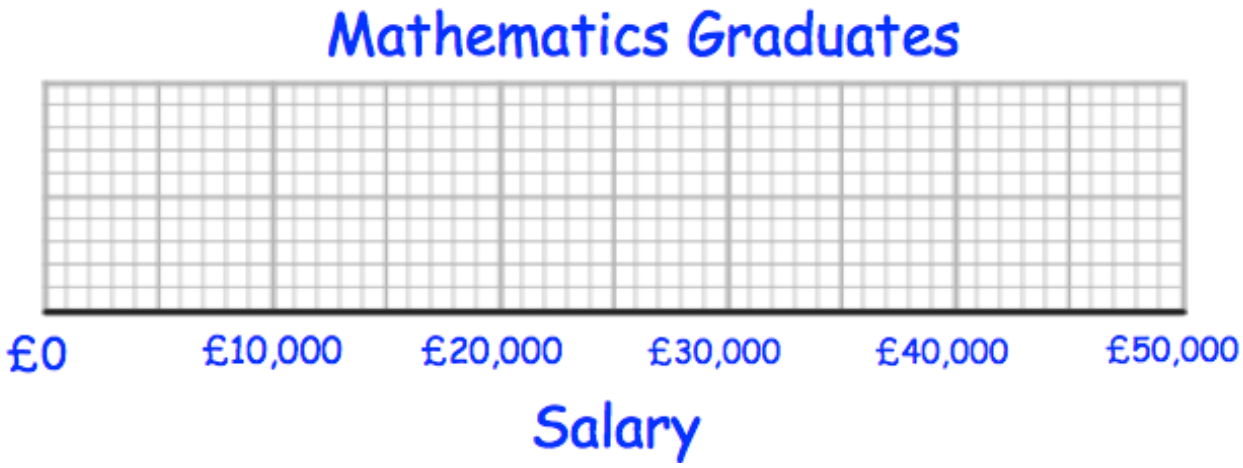
(a) Use the graph to find an estimate for the median salary.

£.....

(1)

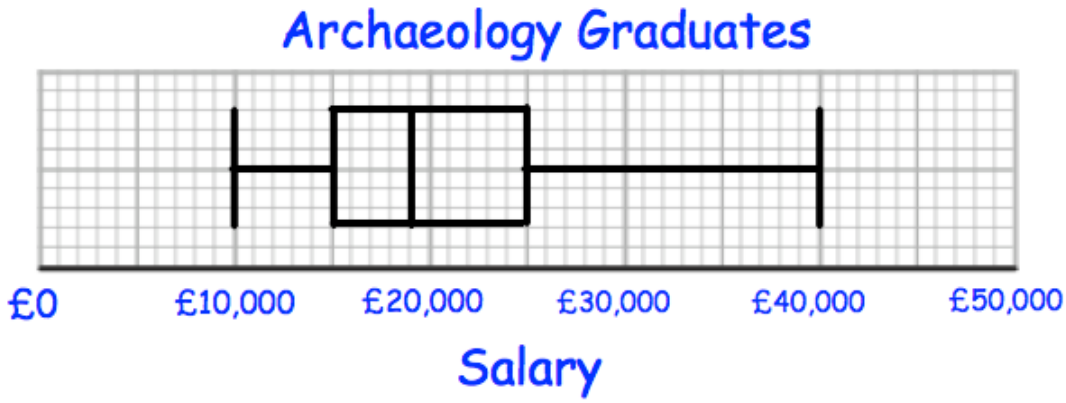
The 60 mathematics graduates
had a minimum salary of £16,000
and a maximum salary of £48,000.

(b) Use this information and the cumulative frequency curve to draw a box plot for the 60 mathematics graduates.



(3)

The university also surveyed 60 archaeology graduates.
The box plot below shows information about their salaries.



(c) Compare the distribution of the salaries of the mathematics graduates with the distribution of the salaries of the archaeology graduates.

.....

.....

.....

(2)

52. Timothy asked 30 people how long it takes them to get to school.

The table shows some information about his results.

Time (t minutes)	Frequency
$0 < t \leq 10$	2
$10 < t \leq 20$	8
$20 < t \leq 30$	12
$30 < t \leq 40$	7
$40 < t \leq 50$	1

Work out an estimate for the mean time taken.

.....minutes
(4)

53. Sally and Laura sit their driving tests.

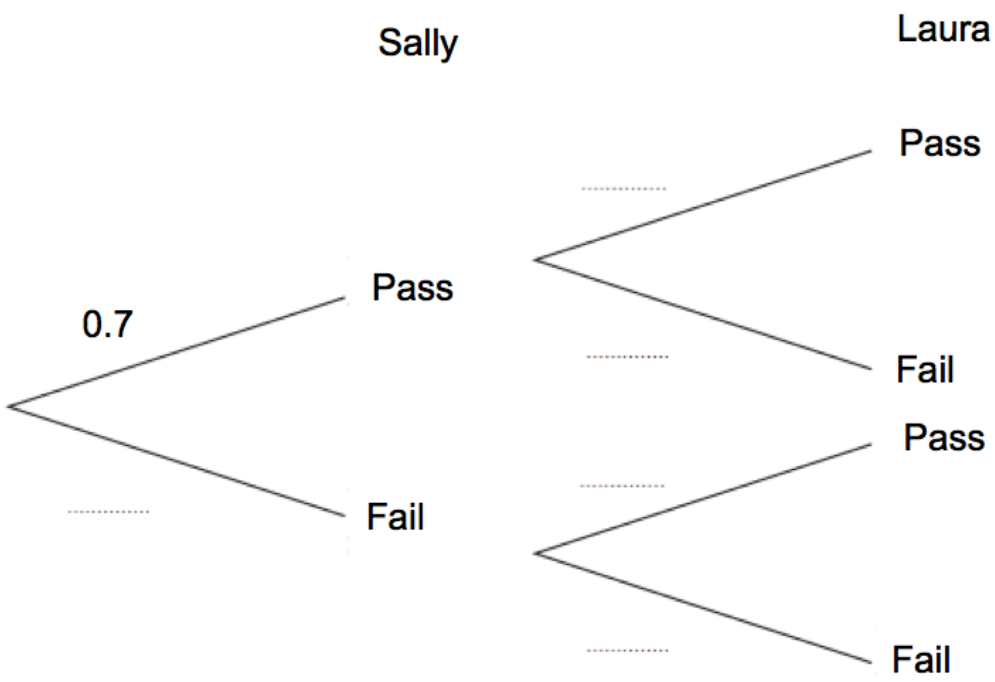
The probability of Sally passing her driving test is 0.7
The probability of both Sally and Laura passing is 0.56

(a) Work out the probability of Laura passing her driving test.

.....

(2)

(b) Complete the tree diagram.



(2)

(c) Find the probability of both women failing.

.....

(2)

54. Expand and simplify $(3y - 2)(y + 3)$

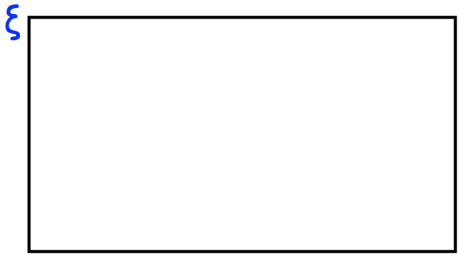
.....

(2)

55. A PE test has two sections, theory and practical.

Everyone in a class who took the PE test passed at least one section.
62% passes the theory section and 83% passed the practical section.

(a) Represent this information on a Venn diagram



(3)

A student is selected at random.

Work out the probability that this person

(a) passed the theory section, given they passed the practical section.

.....

(2)

(b) passed the practical section, given they passed only one section.

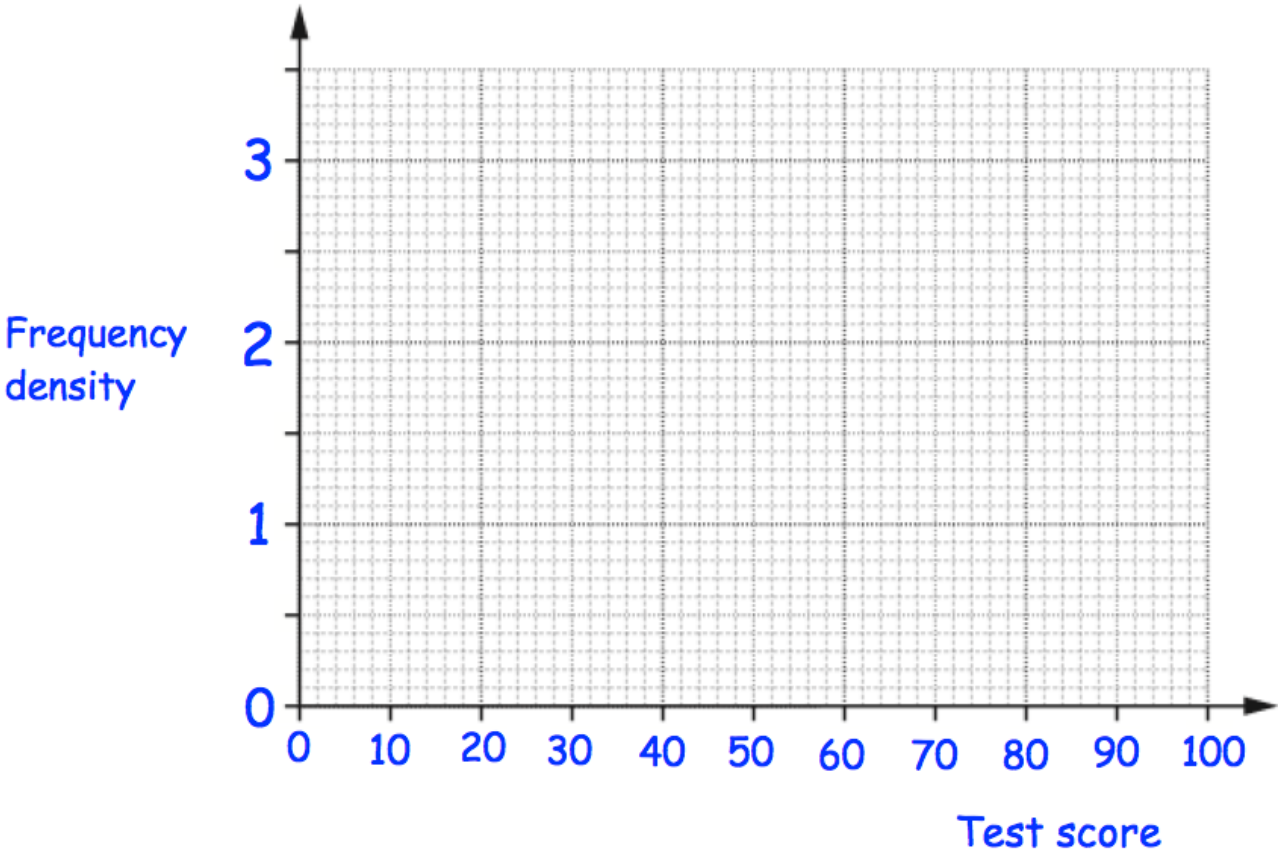
.....

(2)

56. The test scores from the students in a school are summarised in the table.

Test score, x	Frequency
$0 < x \leq 30$	15
$30 < x \leq 40$	22
$40 < x \leq 50$	28
$50 < x \leq 70$	30
$70 < x \leq 100$	9

Draw a histogram for this data.



(3)

57. The volumes of two mathematically similar solids are in the ratio 8 : 125

The surface area of the smaller solid is 24 cm²

Work out the surface area of the larger solid.

.....cm²

(3)

---

58. Anthony measured the length and width of a rectangle.
He measured the length to be 18cm correct to the nearest centimetre.
He measured the width to be 10cm correct to the nearest 10 centimetres.

Calculate the lower bound for the area of this rectangle.

.....cm²

(2)

---

59. Factorise fully

$9m^2 - 12mp$

.....

(2)

---

60. (a) Factorise $y^2 - 12y - 64$

.....

(2)

(b) Factorise $2y^2 + 7y - 15$

.....

(2)

(c) Factorise fully $4y^2 - 49$

.....

(2)

---

61. (a) Solve $m^2 + 24m + 63 = 0$

.....

(2)

(b) Solve $5y^2 + 8y - 100 = y^2 + 4y - 37$

.....

(2)

62. Solve the equation $4x^2 + x - 7 = 0$

Give your answers to two decimal places.

x = ... or x = ...

(3)

---

63. The first 5 terms in a number sequence are

10 7 4 1 -2 ... ...

(a) Work out the *n*th term of the sequence.

.....

(2)

(b) Find the 50th term of the sequence.

.....

(2)

64. Here are the first 5 terms of a quadratic sequence

4 10 18 28 40

Find an expression, in terms of n, for the nth term of this quadratic sequence.

.....

(3)

---

65. Solve $5(3c - 2) - 7c = 40 - 2c$

c = ...

(3)

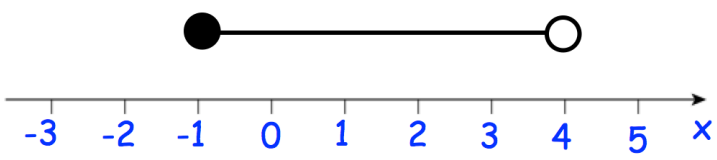
---

66. (a) Solve the inequality $3(x - 4) \leq 15$

.....

(2)

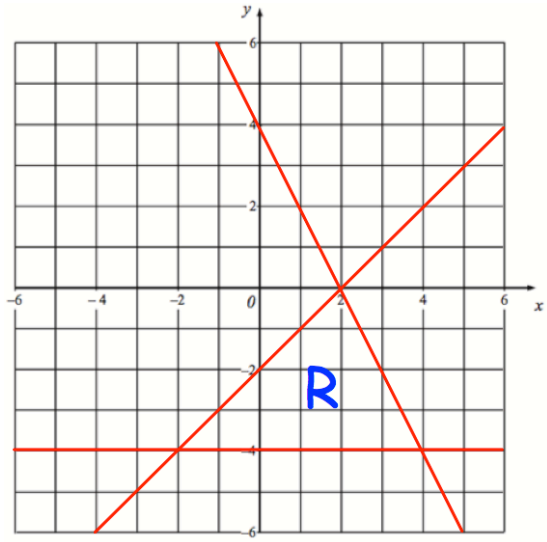
(b) Write down the inequality shown by the diagram.



.....

(2)

67.



The region labelled R satisfies three inequalities.

State the three inequalities

.....

.....

.....

(3)

---

68. Solve the inequality $x^2 + 6x + 8 < 0$

.....

(3)

69. A circle has centre (0, 0) and radius 6.

(a) Write down the equation of the circle.

.....

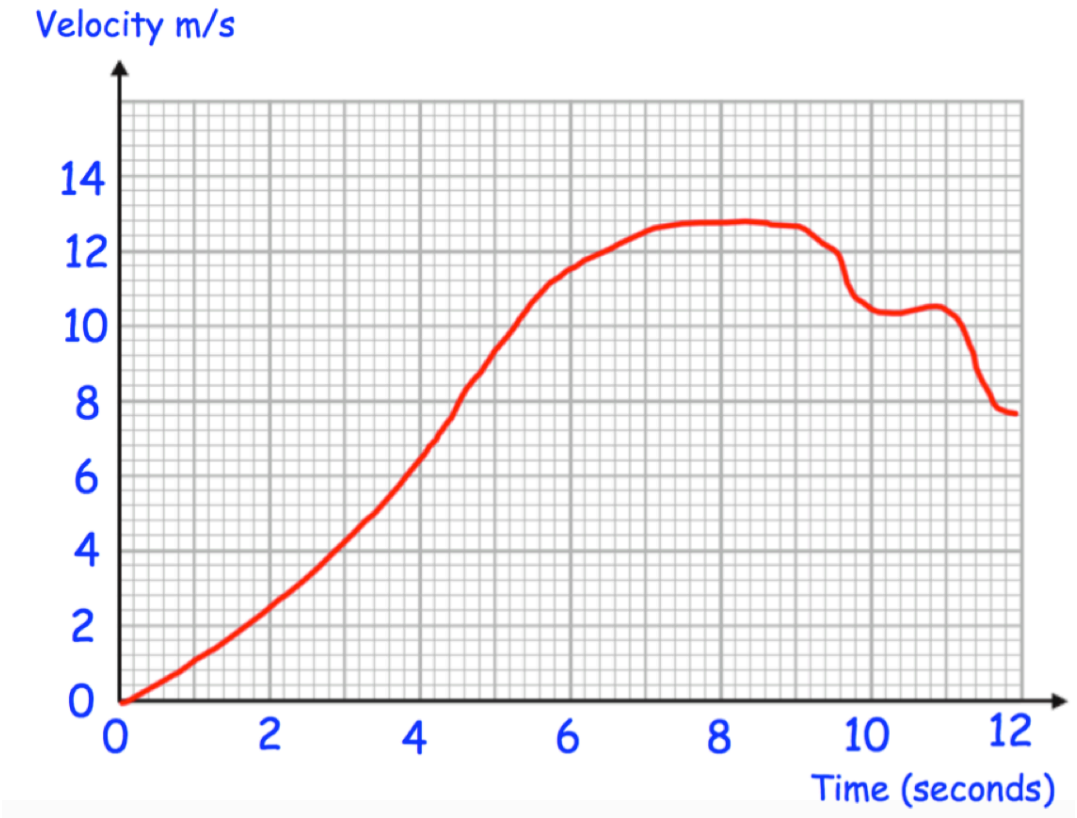
(2)

(b) Does the point (–3 , 5) lie on the circle?

.....

(2)

70.



Above is the velocity-time graph of a particle over 12 seconds.

Find an estimate of the particle's acceleration at 6 seconds
Include suitable units

.....

(3)

71. (a) Simplify

$$\frac{x^2 - 3x + 2}{x^2 + 5x - 6}$$

.....

(3)

(b) Simplify fully.

$$\frac{v + 3}{2} \div \frac{3v + 9}{5}$$

.....

(2)

(c) Solve

$$\frac{7}{x + 2} + \frac{10}{2x - 5} = 3$$

.....

(5)

72.

The functions $f(x)$ and $g(x)$ are given by the following:

$$f(x) = 3x - 1$$
$$g(x) = 2x + 4$$

(a) Calculate the value of $fg(2)$

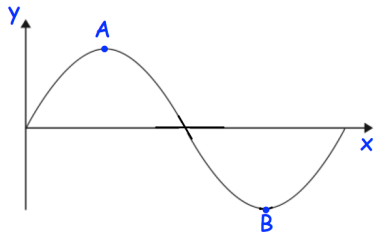
.....
(2)

(b) Find $f^{-1}(x)$

.....
(2)

---

73. Shown is part of the curve y = sin x



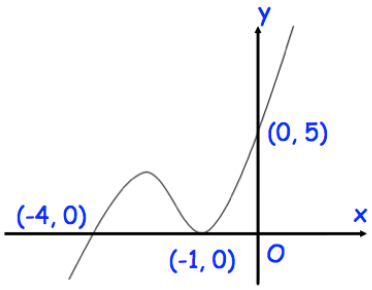
(a) Write down the coordinates of the point A.

(..... , ...)
(1)

(b) Write down the coordinates of the point B.

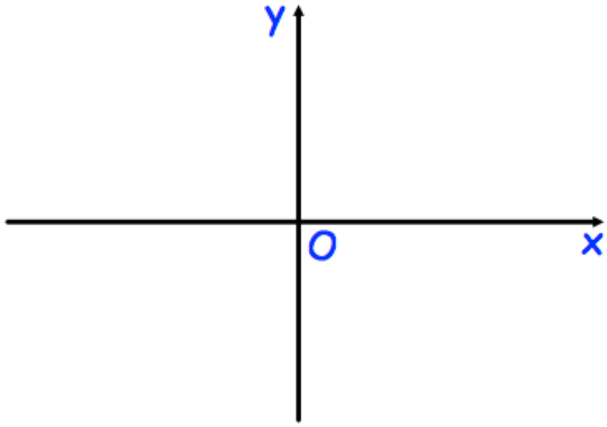
(..... , ...)
(1)

74. Shown below is the curve with equation y = f(x).
The curve passes through the points (-4, 0), (-1, 0) and (0, 5)



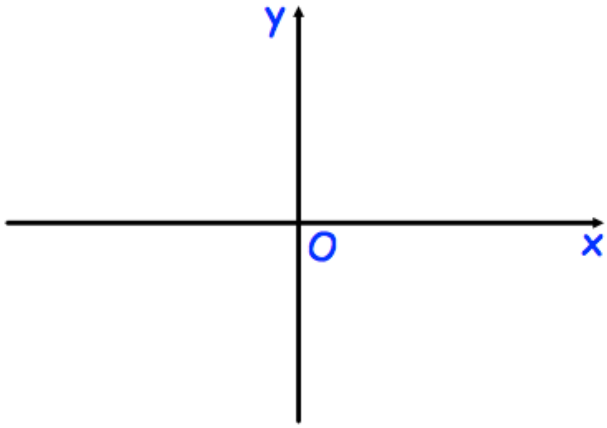
Sketch the curve with equation:

(a) y = f(x – 1)



(2)

(b) y = f(–x)



(2)

75. Write $x^2 + 8x + 6$ in the form $(x + a)^2 + b$, where a and b are constants.

.....

(3)

---

76. (a) Show that the equation $20 - x^3 - 7x^2 = 0$ can be rearranged to give

$$x = \frac{20}{x^2} - 7$$

(2)

(b) Using $x_{n+1} = \frac{20}{x_n^2} - 7$ with $x_0 = -9$

find the values of x_1 , x_2 and x_3

x_1 = ...

x_2 = ...

x_3 = ...

(3)

(b) Explain what the values of x_1 , x_2 and x_3 represent

.....

.....

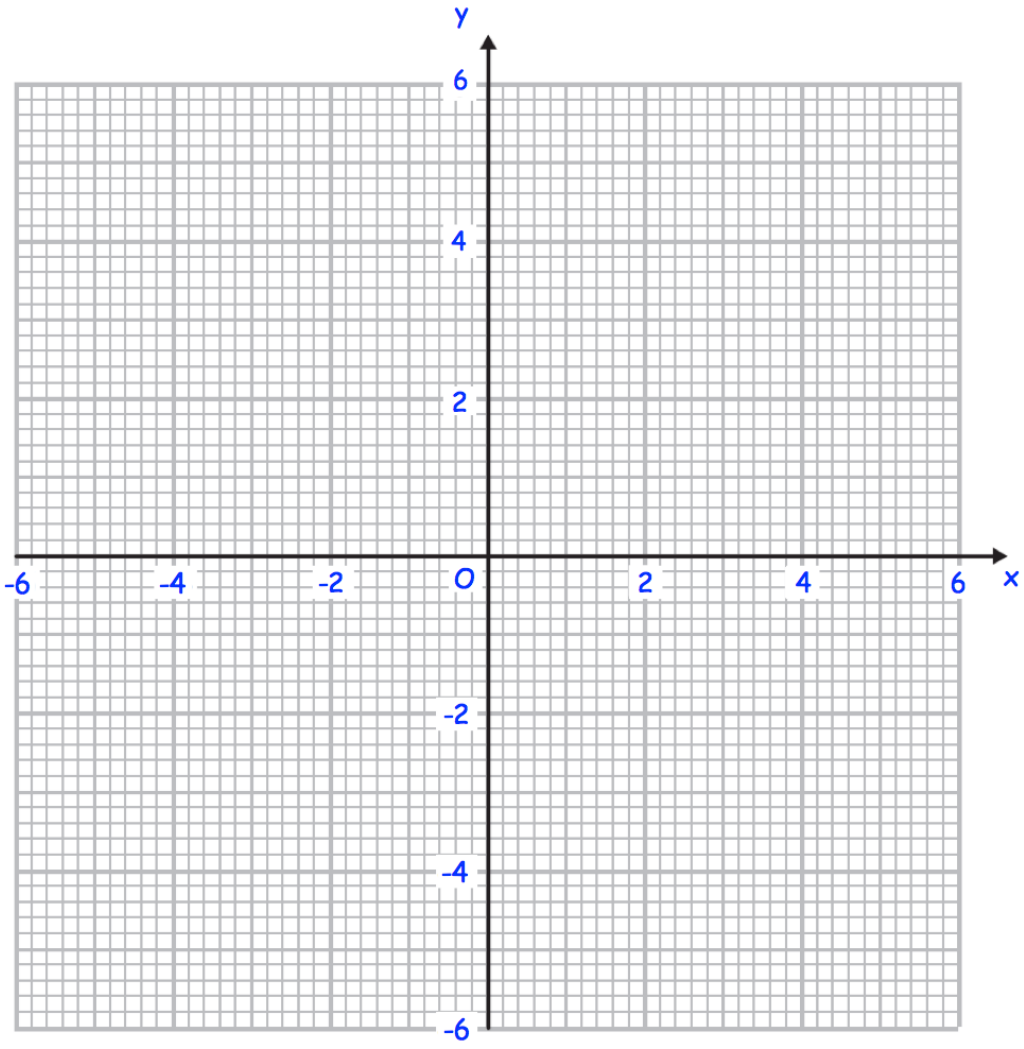
(2)

77. (a) Complete the table of values for $y = \frac{2}{x}$

x	-5	-2	-1	-0.5	0.5	1	2	5
y								

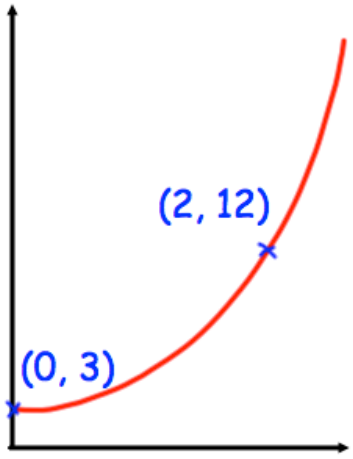
(2)

(b) On the grid, draw the graph of $y = \frac{2}{x}$ for $-5 \leq x \leq 5$



(2)

78.



The sketch shows a curve with equation
$y = ab^x$ where a and b are constants and $b > 0$

The curve passes through the points (0, 3) and (2, 12)

Calculate the value of a and b

a = ...

b = ...

(3)

79. Write $0.5\dot{1}\dot{2}$ as a fraction.
Give your answer in its simplest form.

.....

(3)

---

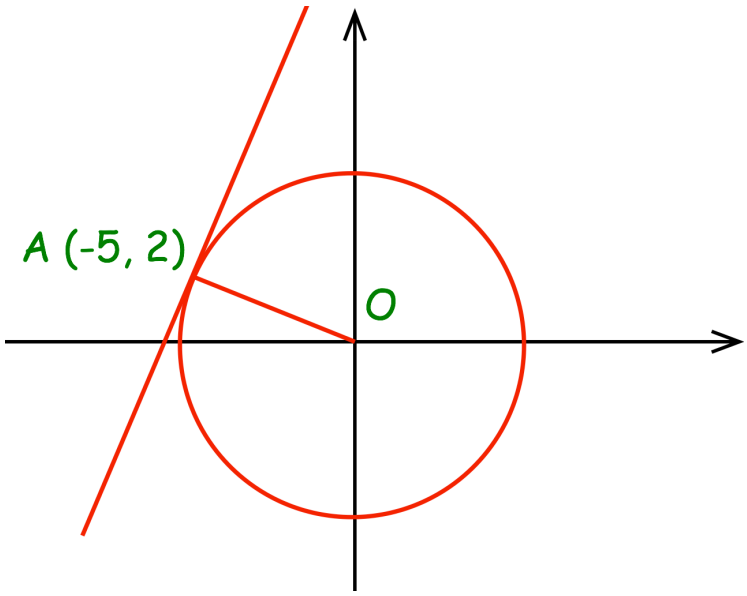
80. Show that $(\sqrt{2} + 3\sqrt{8})^2 = 98$

.....

(3)

81.

The diagram shows the circle $x^2 + y^2 = 40$ with a tangent at the point (2, 6)



(a) Find the gradient of the line AO.

.....

(1)

(b) Find the gradient of the tangent

.....

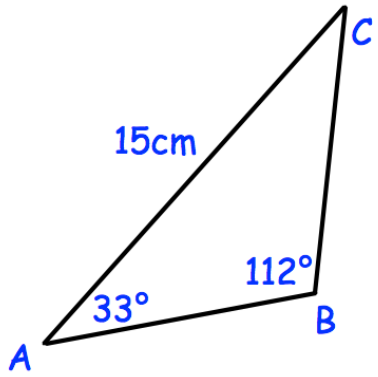
(1)

(c) Find the equation of the tangent

.....

(2)

82. (a)

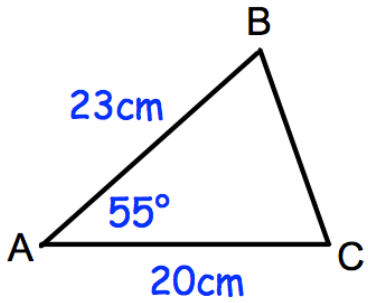


In triangle ABC the length of AC is 15cm.
Angle ABC = 112°
Angle BAC = 33°

Work out the length of BC.

.....cm
(3)

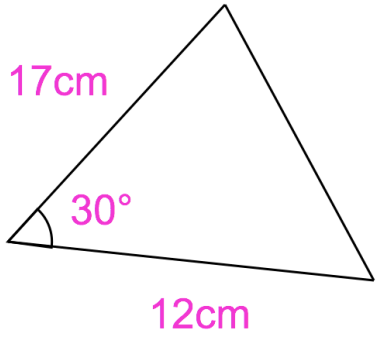
(b)



Calculate the length of BC.

.....cm
(3)

83.



Calculate the area of the triangle.

.....cm²

(2)

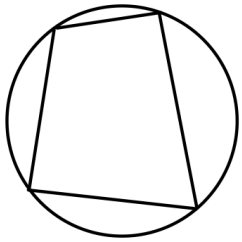
84.

Find the pressure exerted by a force of 240 newtons on an area of 30cm².
Give your answer in newtows/m²

.....

(3)

85.



Prove the opposite angles in a cyclic quadrilateral add to 180°

86. The number of days, D, to complete research is inversely proportional to the number of researchers, R, who are working.

The research takes 125 days to complete is 16 people work on it.

Find how many people are needed to complete the research in 40 days.

.....

(5)

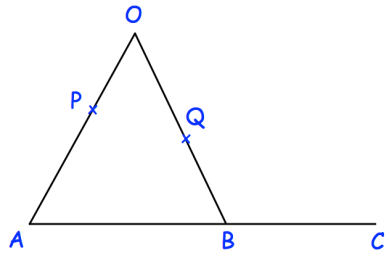
87. A straight line, L, is perpendicular to the line with equation $y = 2x + 3$
L passes through the point (10, 3)

Find an equation for the straight line L.

.....

(3)

88.



AOB is a triangle.
P is a point on AO.

$\overrightarrow{AB} = 2\mathbf{a}$ $\overrightarrow{AO} = 6\mathbf{b}$ $AP:PO = 2:1$

(a) Find the vector $\overrightarrow{OB}$ in terms of **a** and **b**

.....

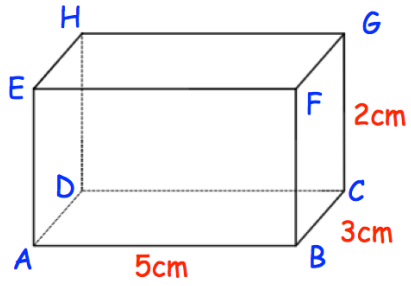
(1)

Q is the midpoint of OB.
B is the midpoint of AC.

Show PQC is a straight line.

(3)

89. Shown below is a cuboid



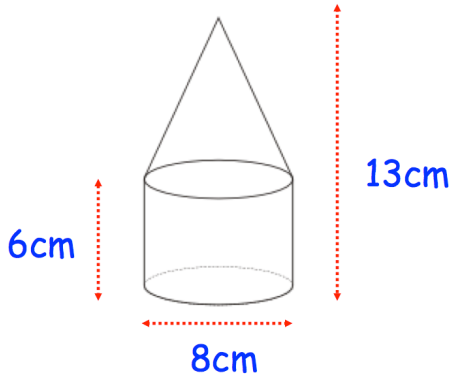
Calculate the size of angle ACE.

.....

(4)

---

90. A solid is formed from a cylinder and a cone.
Find the volume of the solid.



.....cm³

(3)

91. There are 8 sweets in a bag.
Three sweets are red, three sweets are blue and two sweets are green.

Three sweets are selected at random **without** replacement.

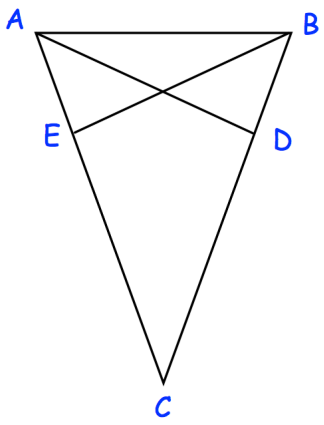
Calculate the probability that the sweets are **not** all the same colour.

.....

(4)

---

92. ABC is an isosceles triangle in which AC = BC.
D and E are points on BC and AC such that CE = CD.



Prove triangles ACD and BCE are congruent.

(4)

93. Prove the sum of four consecutive odd numbers is always a multiple of 8

(4)

---

94. Find the exact value of $\sin(45°) + \cos(30°)$

.....

(3)

95. Bag A contains 5x coins.
Bag B contains 3x coins.
8 coins are taken from Bag B and put into Bag A
The ratio of coins in Bag A to Bag B is now 11:5

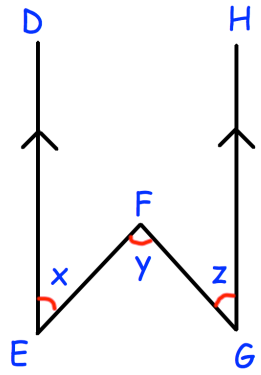
Work out the total number of coins.

.....

(3)

---

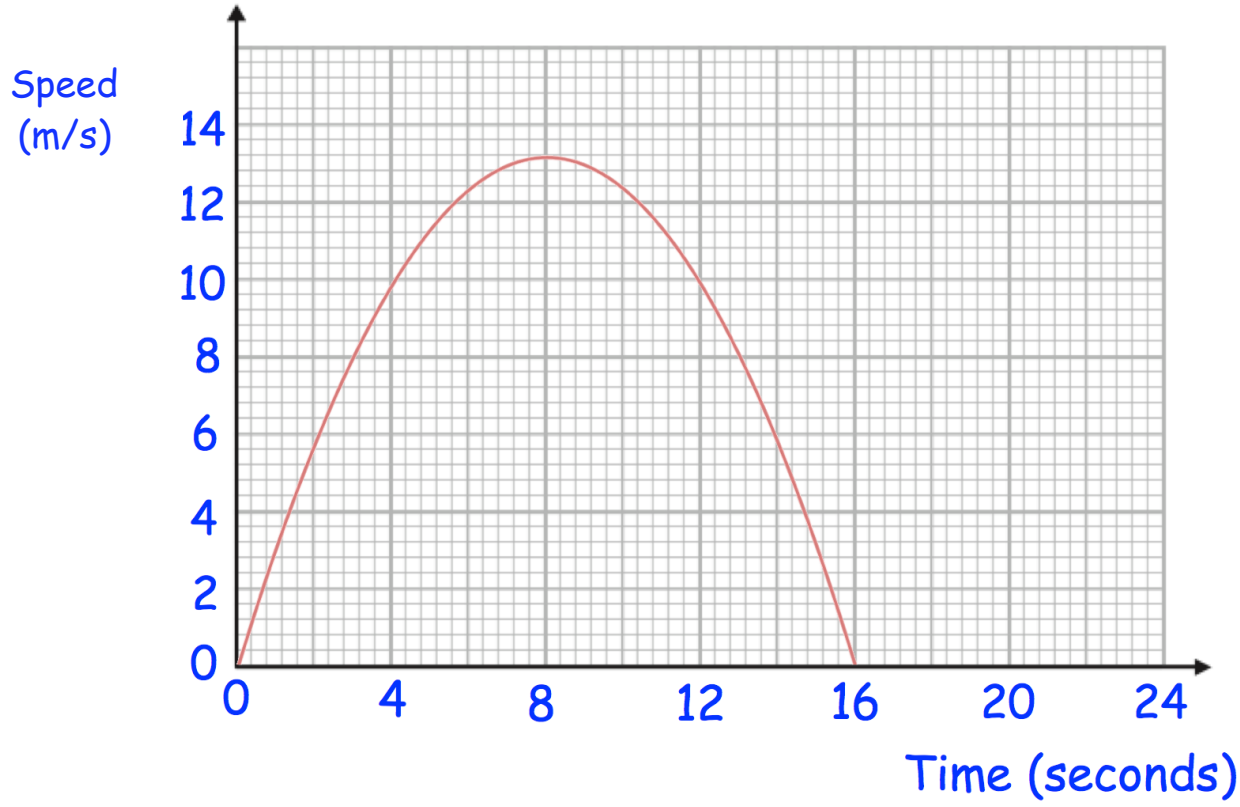
96. In the diagram below, the lines ED and GH are parallel.



Prove that $x + z = y$

(3)

97. Here is a speed-time graph for a toy rocket.



(a) Work out an estimate for the distance the rocket travelled in the 16 seconds.
Use 4 strips of equal width.

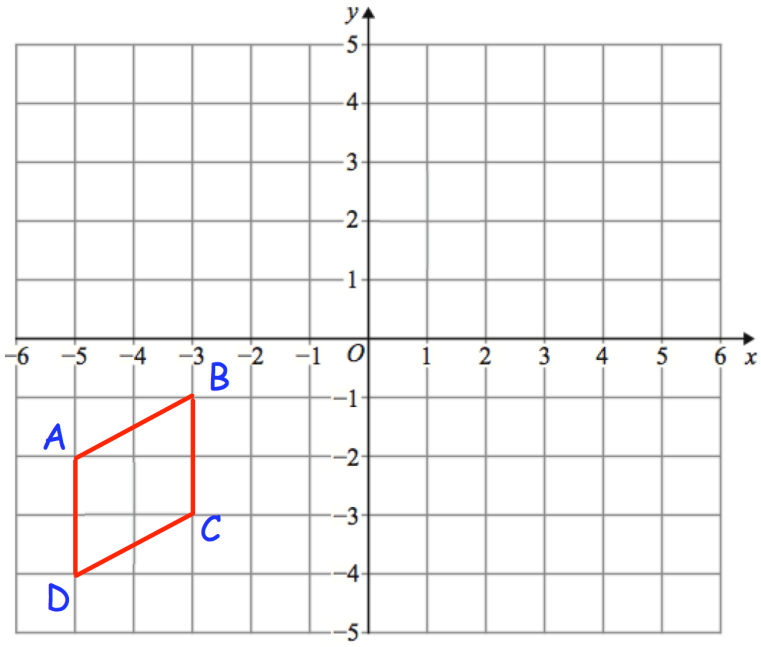
……..m
(3)

(b) Is your answer to (a) an underestimate or an overestimate of the actual distance the rocket travelled?
Give a reason for your answer

……

……
(1)

98. Here is quadrilateral ABCD



ABCD is reflected in the line $x = -1$

followed by a reflection in the line $y = -x$

followed by a rotation of 180° about $(-1, -1)$

Which of the vertices are invariant?

.....

(3)