Paper 5 and Paper 6 Preparation Paper

OCR Higher

Corbettmaths

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

You will need a calculator

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Paper 2 and 3 Checklist

Question	Topic	Video number
Starred Topics		
1	Adding Fractions	133
2	Multiplying Fractions	142
3	Dividing Fractions	134
4	Decimals	90,91,92,93,94
5	Best Buys	210
6	Currency	214a
7	LCM/HCF	218,219
8	Product of Primes	223,224
9	Indices (fractional/negative)	173,175
10	Percentages of Amounts	234,235,238
11	Percentage Change	233
12	Reverse Percentages	240
13	Recurring Decimals to Fractions	96
14	Ratio	270,271,271a,271b,271c
15	Limits of Accuracy	183,184
16	Product Rule for Counting	383
17	Error Intervals	377,280
18	Algebraic Fractions	21,22,23,24
19	Sequences (nth term)	288,289
20	nth term (quadratics)	388
21	Equations	110,113,114,115
22	Changing the Subject	7,8
23	Inequalities (regions)	182
24	Quadratic Inequalities	378
25	Real-life Linear Graphs	171a
26	Perpendicular Lines	196,197
27	Non-linear Simultaneous Equations	298
28	Angles in Parallel Lines	25,39
29	Bearings	26,27

Question	Topic	Video number
30	Constructions	78,72,79,80,70
31	Loci	75,76,77
32	Views	354
33	Area of a Sector	48
34	Volume of a Cylinder	357
35	Trigonometry	329,330,331
36	3D Trig & Pythagoras	259,332
37	Exact Trig Values	341
38	Volume of a Prism	356
39	Volume of Cone/Pyramid/Sphere	359-361
40	Volume of a Frustum	360a
41	Surface Area of a Prism	311
42	Surface Area of Cone/Sphere	314,313
43	Translations	325
44	Reflections	272
45	Rotations	275
46	Enlargements	104,106,107,108
47	Similar Shapes	292,293a,293b
48	Cosine Rule	335,336
49	1/2abSinC	337
50	Vectors	353
51	Congruent Triangles	67
52	Histograms	157,158,159
53	Independent Events	250
54	Estimated Mean	55
55	Combined Mean	53a
56	Conditional Probability	247
57	Tree Diagrams	252
58	Equation of a Tangent	372

Question	Topic	Video number
59	Composite Functions	370
60	Inverse Functions	369
61	Quadratic Graphs	264
62	Solving Quadratics Graphically	367
63	Trigonometric Graphs	338,339
64	Cubic Graphs	344
65	Reciprocal Graphs	346
66	Exponential Graphs	345
67	Geometric Sequences	375
68	Algebraic Proof	365
69	Quadratic Formula	267
70	Completing the Square	10,371
71	Transformations of Graphs	323,324
Other Unseen Topics (or usually more prominent)		
72	Reciprocal	145
73	Estimation	215
74	Conversion Graphs	151,152
75	Standard Form	300,301,302,303
76	Simple Interest	236a
77	Direct Proportion	254
78	Proportional Graphs	255b
79	Proportion (application)	255c
80	Surds	305,306,307,308
81	Collecting Like Terms	9
82	Factorising	117
83	Factorising Quadratics	118,119,120,119a
84	Substitution	20
85	Inequalities	177,178,179
86	Linear Graphs	191,186,189,194
87	Midpoint of a Line	198

Question	Topic	Video number
88	Distance between 2 points	185
89	Graphical Simultaneous Equations	297
90	Area of a Circle	40
91	Arc Length	58
92	Pythagoras	257,259
93	Metric Units (area/volume)	350,351
94	Circle Theorems	64, 65
95	Sine Rule	333
96	Travel Graphs	171
97	Density	384
98	Pressure	385
99	Geometric Proof	366
100	Invariant Points	392
101	Frequency Trees	376
102	Two-way Tables	319
103	Pie Charts	163,164
104	Box Plots	149
105	Median (frequency table)	51,52
106	Modal Class (frequency table)	56a
107	Relative Frequency	248
108	Area under a Graph	389
109	Sketching Quadratics	265
110	Identities	16a
Seen Topics (remember they may still appear, so they may be worthwhile recapping)		
See website	Use of a Calculator	352
See website	Indices	172, 174
See website	Compound Interest	236
See website	Inverse Proportion	255
See website	Expanding Brackets	13, 14, 15
See website	Parallel Graphs	196

Question	Topic	Video number
See website	Simultaneous Equations	295
See website	Angles in Polygons	32
See website	Area of a Trapezium	48
See website	Circumference	60
See website	Speed	299
See website	Scatter Graphs	165, 166
See website	Cumulative Frequency	153, 154
See website	Samples	281a
See website	Venn Diagrams	380
See website	Equation of a Circle	12
See website	Rates of Change	390
See website	Iteration	373, 373a, 373b

1. Hannah is baking two cakes.

One cake needs 1⅓ cups of milk.
Hannah has 1¼ cups of milk.

How much more milk does Hannah need?

.....cups
(3)

2. Work out

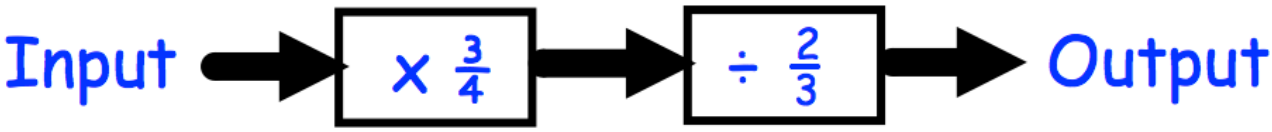
$$1\frac{1}{3} \times 2\frac{2}{5}$$

Give your answer as a mixed number.

.....

(3)

3.



(a) Find the output, if the input is 2.

.....

(3)

(b) Find the input, if the output is ½

.....

(3)

4. Work out 0.017×0.45

.....

(2)

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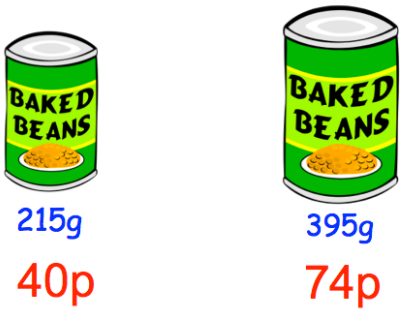
5. A supermarket sells Baked Beans in two different size cans.



Which size can is the best value for money?
You must show all your working.

(4)

6. James has received two job offers.

A job in Milan which pays €55,000 a year.
A job in Boston which pays $64,000 a year.

The exchange rates were £1 = $1.42 and £1 = €1.25.

Which job offer has the highest salary?
Show working to explain your answer.

(3)

---

7. Find the Lowest Common Multiple (LCM) of 60 and 72.

.....

(2)

8. (a) Express 108 as a product of its prime factors.
Give your answer in index form.

.....

(3)

(b) Find the Highest Common Factor (HCF) of 108 and 72.

.....

(2)

---

9. (a) Write 32 in the form 4^n

.....

(2)

(b) Write $\frac{1}{8}$ in the form 2^n

.....

(2)

10. Harriet travelled from Bath to Cardiff.
Her average speed was 58 miles per hour.

There is traffic on the return journey.
Her average speed is reduced by 23%

Work out the average speed on the return journey.

.....mph
(3)

---

11. Terry goes to the Post Office to exchange money.

Terry changes $651 and €161.20 into pounds sterling.
The Post Office deducts their commission and gives Terry £528.

What is the percentage commission?

.....%
(4)

12. In a sale the price of a sofa is reduced by 70%.
The sale price is £255

Work out the price before the sale.

£.....

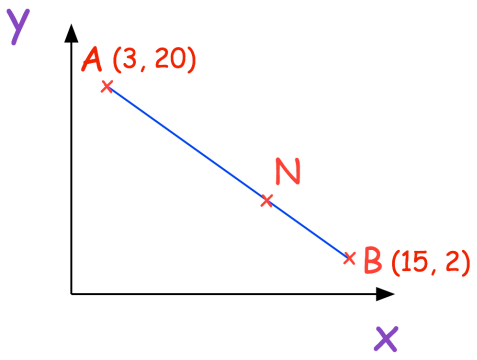
(3)

---

13. Show algebraically that $0.3\dot{0}\dot{9}$ can be written as $\frac{17}{55}$

(3)

14. A is the point with coordinates (3, 20)
B is the point with coordinates (15, 2)
N is a point of the line AB such that AN : NB = 2 : 1



Find the coordinates of the point N.

.....
(3)

---

15. Declan ran a distance of 200m in a time of 26.2 seconds.

The distance of 200m was measured to the nearest 10 metres.
The time of 26.2 was measured to the nearest tenth of a second.

Work out the upper bound for Declan's average speed.

.....m/s
(2)

16. Jacob picks a 5-digit **even** number.

The first digit is a prime number.
The third digit is odd.
The fourth digit is 8

How many different 5-digit number could he pick?

.....

(3)

---

17. Nigel measures the time, t seconds, to complete a race as 15.4 seconds correct to the nearest tenth of a second.

Write down the error interval for t.

.....

(2)

---

18. Solve

$$\frac{1}{x+3} - \frac{1}{x+1} = 2$$

.....

(5)

19. The first five terms in a sequence are 10, 17, 24, 31, 38 …

Write down the nth term of the sequence.

.....

(2)

---

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

9 17 29 45 65

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

.....

(3)

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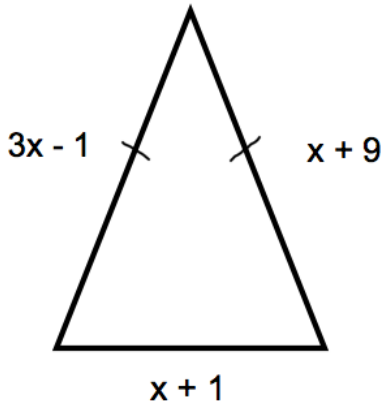
21. Shown below is an isosceles triangle. Each side is measured in centimetres.



Find the perimeter of the triangle

.....

(4)

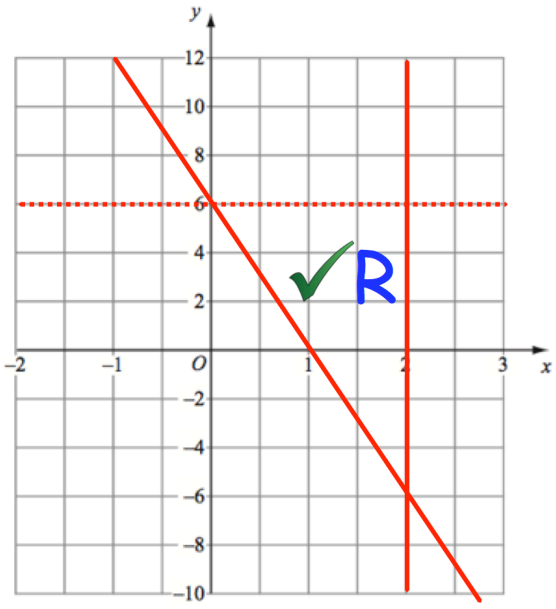
22. Make v the subject of the formula.

$$s = \frac{1}{2}(u + v)t$$

v = ...

(3)

23.



The region labelled R satisfies three inequalities.

State the three inequalities

.....

.....

.....

(3)

24. Solve the inequality $x^2 - 9x + 14 \leq 0$

.....

(3)

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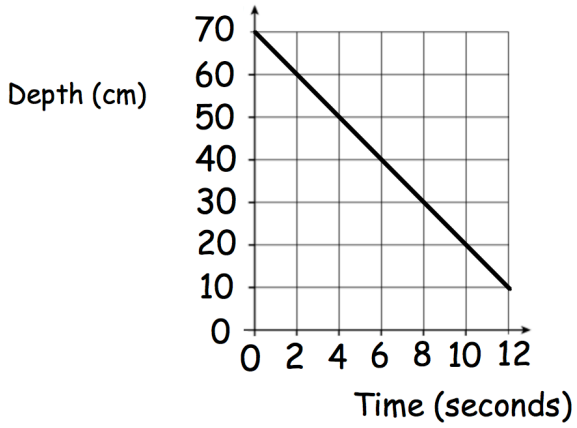
25. The graph below shows the depth of water in a container.



(a) Write down the gradient of the line

.....

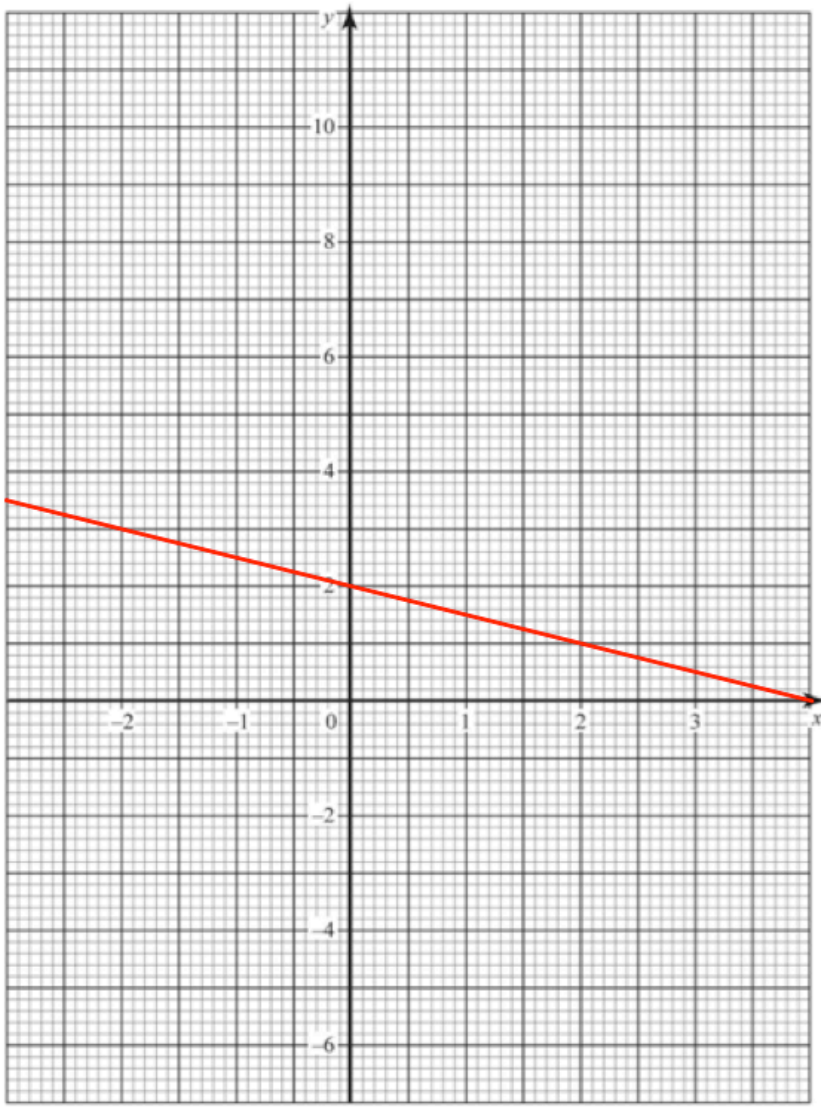
(1)

(b) What does the gradient of the line represent?

.....

(1)

26.



The straight line L has equation $y = -\frac{1}{2}x + 2$

(a) Write down the equation of a line parallel to L

.....

(1)

(b) Find an equation of the line that goes through the point (1, 6) and is perpendicular to L

.....

(3)

27. Solve the simultaneous equations

$2x + y = 5$
$2x^2 + y^2 = 11$

.....

(4)

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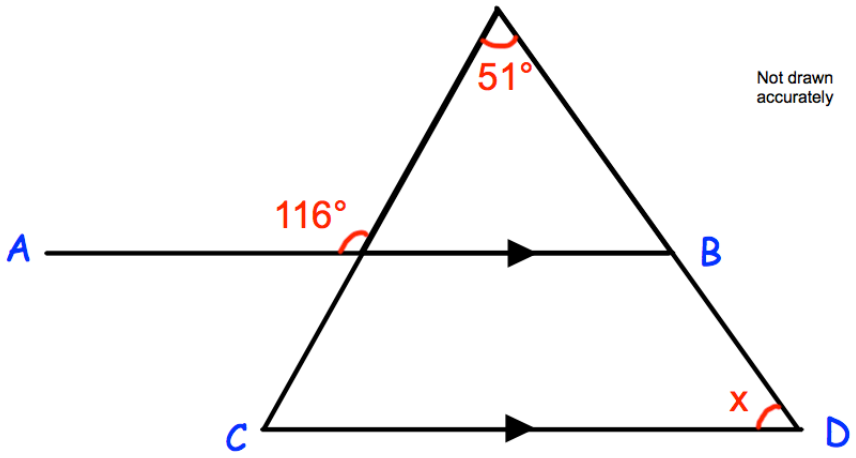
28. In the diagram, AB is parallel to CD.



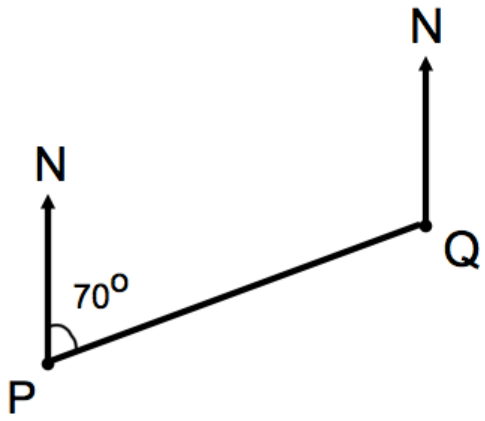
Work out the size of angle x.

You **must** show your workings.

.....°

(4)

29. The diagram shows the position of two airplanes, P and Q.



Not drawn accurately

The bearing of Q from P is 070^0.

Calculate the bearing of P from Q.

.....°

(2)

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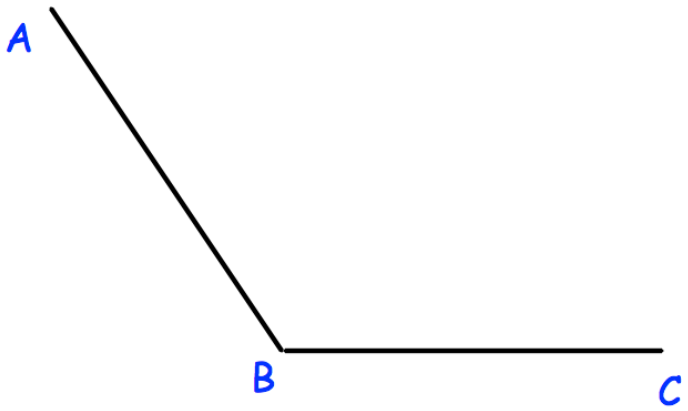
30. Using ruler and compasses, construct the bisector of angle ABC.



(2)

31. The diagram shows two lighthouses.
A boat is within than 8 miles of lighthouse A.
The same boat is within 6 miles of lighthouse B.
Shade the possible area in which the boat could be.

(2)

---

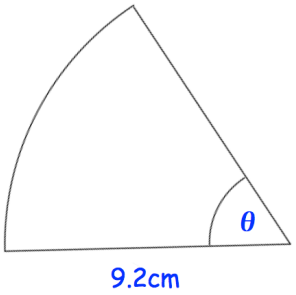
32. The front elevation of a solid shape is a circle.
The side elevation of the solid shape is a rectangle.
The plan view of the solid shape is a rectangle.

Write down the name of the shape.

.....

(1)

33. Shown is a sector of a circle with radius 9.2cm.

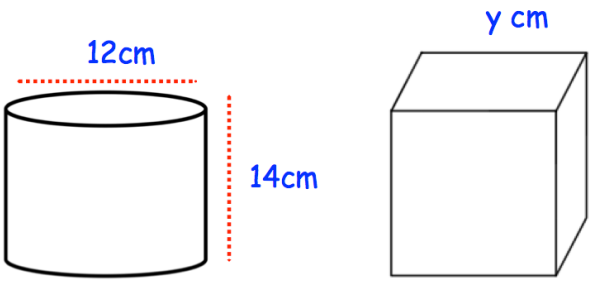


The area of the sector is 38.4cm²

Find the size of angle θ
Give your answer to 2 significant figures.

.....°
(3)

34.

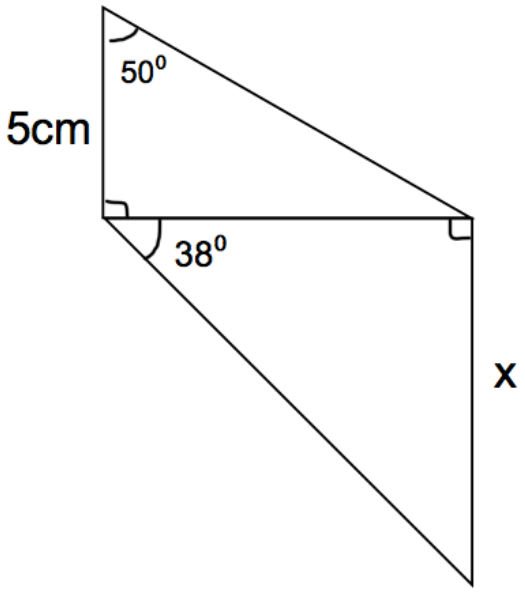


A cylinder has diameter 12cm and height 14cm.
A cube has side length y cm.
The cylinder and cube has the same volume.

Find y.

..... cm
(4)

35. The diagram shows two right-angled triangles.

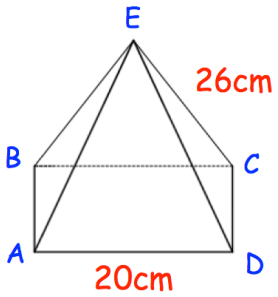


Calculate the value of x.

.....cm

(5)

36. Shown below is a square based pyramid.
The apex E is directly over the centre of the base.



AD = 20cm
CE = 26cm

(a) Work out the length of AC

.....cm
(2)

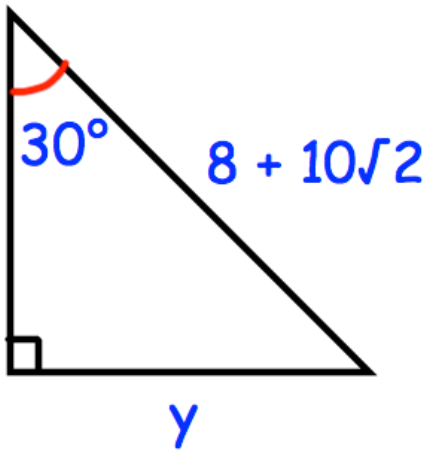
(b) Calculate angle CAE

..... °
(2)

(c) Work out the height of the pyramid

.....cm
(2)

37. Shown below is a right angled triangle.



Find the exact length of the side labelled y.

.....

(4)

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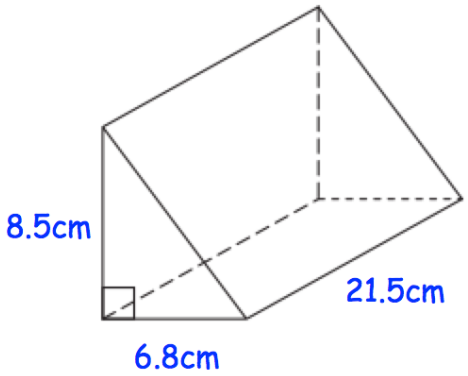
38. Shown below is a triangular prism.

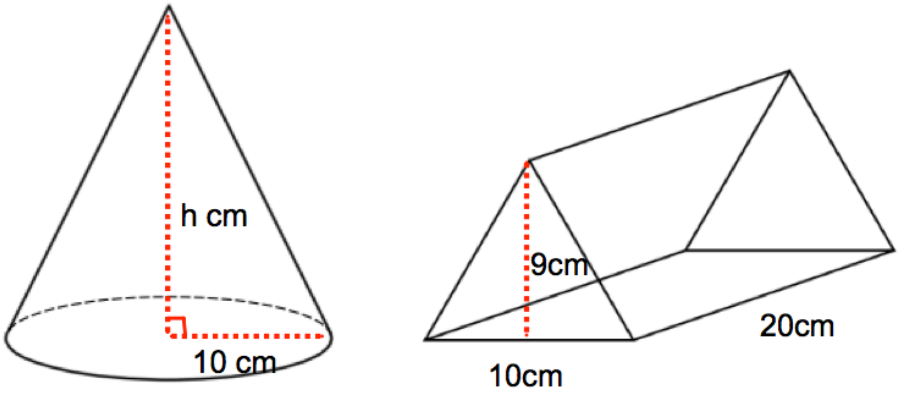


Find the volume of the triangular prism.

.....cm³

(3)

39. Shown is a cone and a triangular prism.



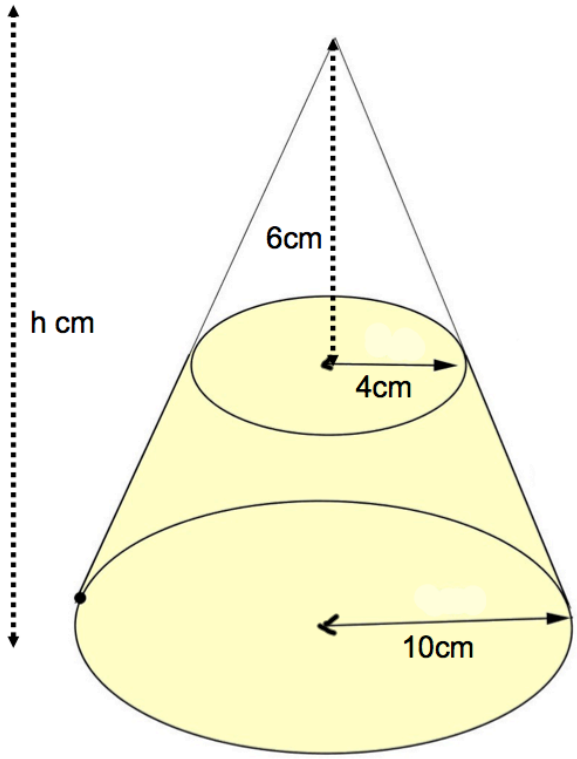
Both solids have the same volume.

Calculate the height of the cone.

.....cm

(3)

40. A cone below has base radius 10cm and height h cm.
A smaller cone radius 4cm and height 6cm is cut from the top.
The frustum is shown below.



Calculate the volume of the frustum.

.....cm³

(5)

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41. A cube has a volume of 343cm³

Work out the surface area of the cube.

.....cm²

(2)

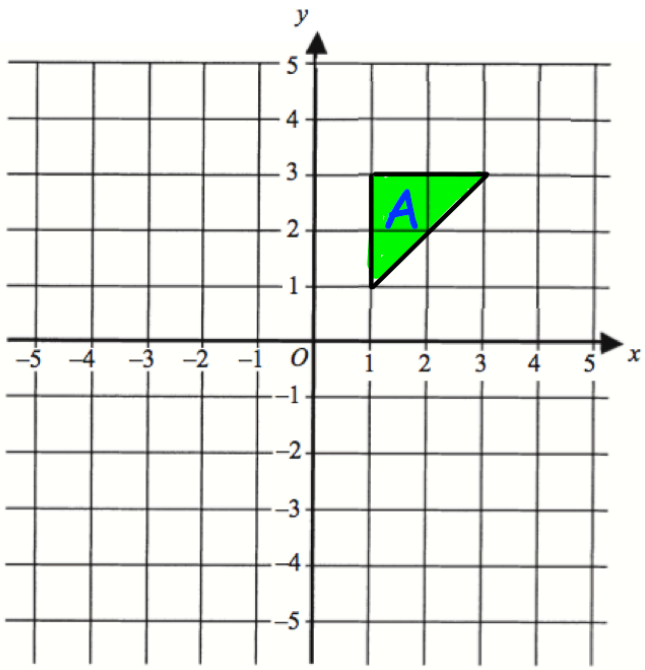
42. A sphere has a radius of 5cm.

Calculate the surface area of the sphere.

.....

(3)

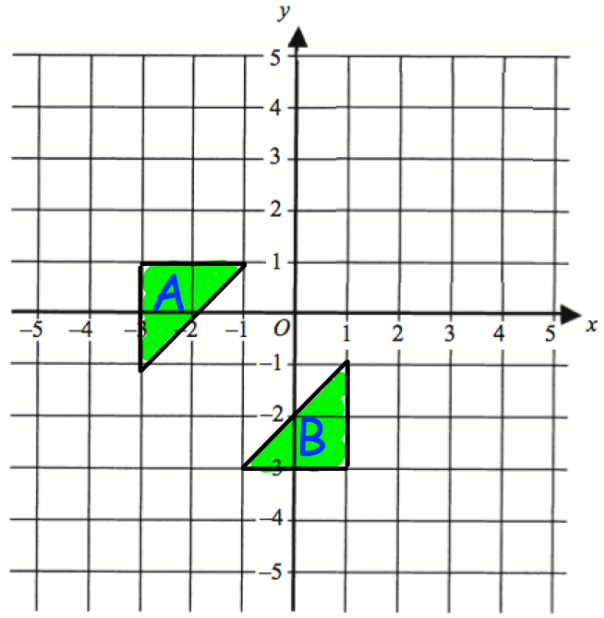
43.



Translate triangle A by the vector $\begin{pmatrix} -3 \\ 1 \end{pmatrix}$

(2)

44.



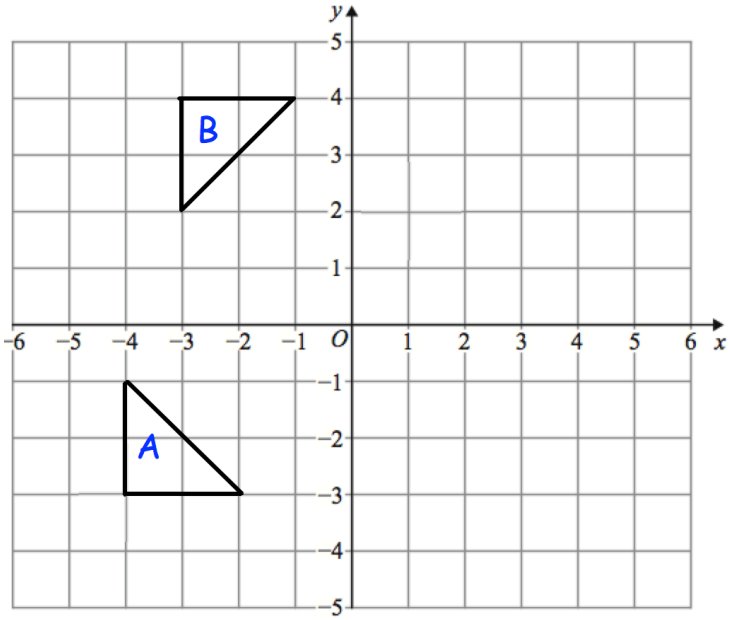
Describe fully the single transformation that maps triangle A onto triangle B.

.....

.....

(2)

45.



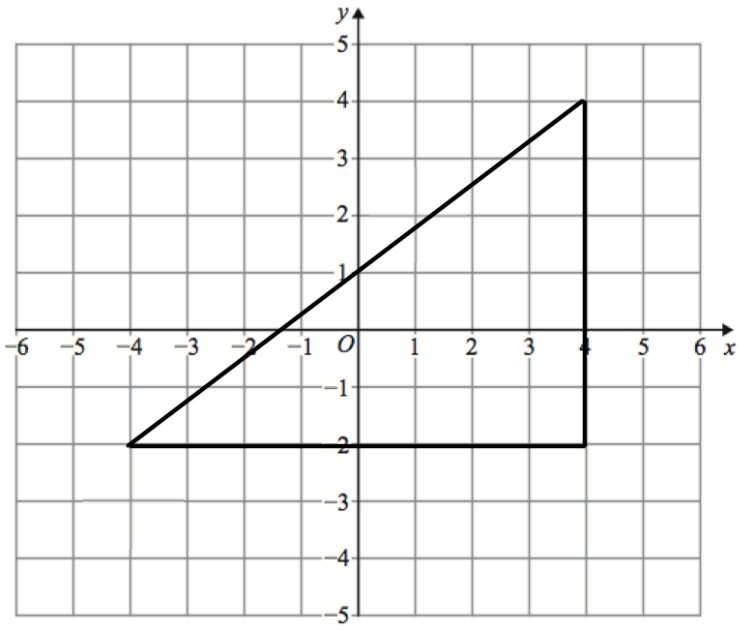
Describe fully the single transformation that maps triangle A onto triangle B.

.....

.....

(2)

46.



Enlarge the triangle by scale factor –½, using centre of enlargement (2, 0)

(3)

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47. Mrs Hampton is potting plants.
She is using two mathematically similar pots, the smaller is 10cm tall and the larger 14cm tall.

She has two bags of soil, each containing 30 litres of soil.

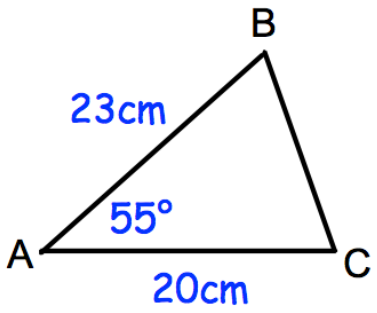
With the first bag, Mrs Hampton fills 20 small pots using all of the soil in the bag.

How many large pots can be filled completely using the second bag of soil?

.....

(5)

48.

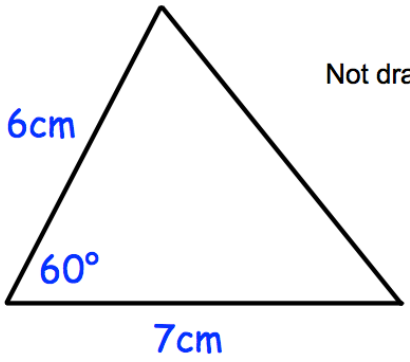


Calculate the length of BC.

.....cm

(3)

49.



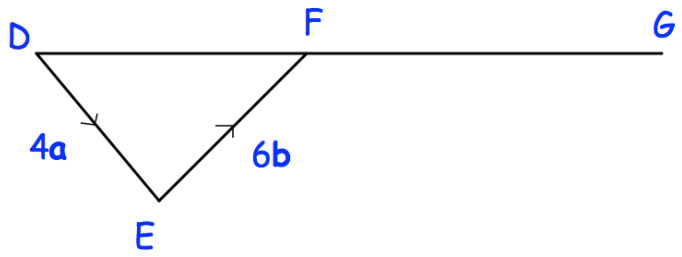
Calculate the area of the triangle.

.....cm²

(2)

50. DFG is a straight line.

$\overrightarrow{DE} = 4\mathbf{a}$ and $\overrightarrow{EF} = 6\mathbf{b}$



(a) Write down the vector $\overrightarrow{DF}$ in terms of **a** and **b**

.....

(1)

(b) DF : FG = 2:3

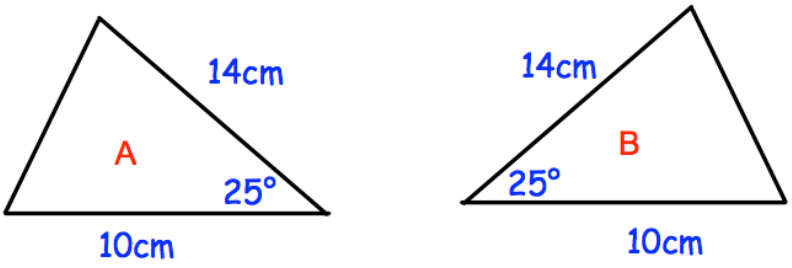
Work out the vector $\overrightarrow{DG}$ in terms of **a** and **b**
Give your answer in its simplest form.

.....

(2)

51. For each pair below, state the condition why they are congruent.

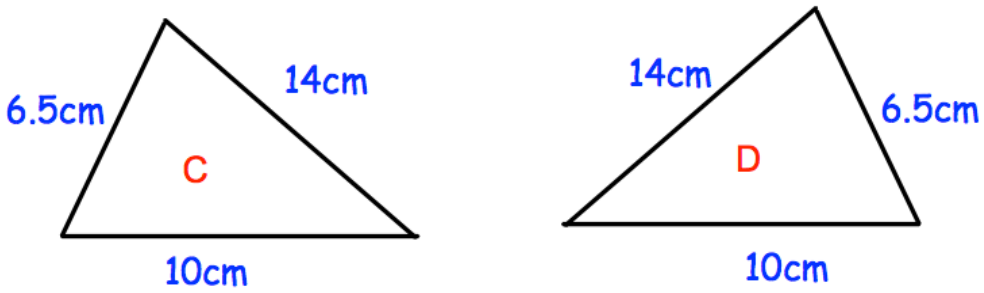
(a)



Condition: .....

(1)

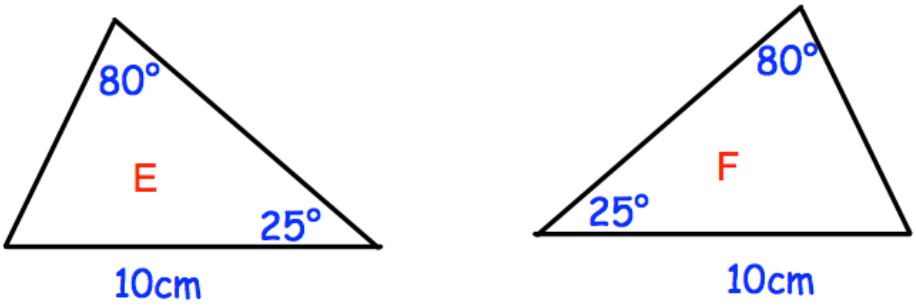
(b)



Condition: .....

(1)

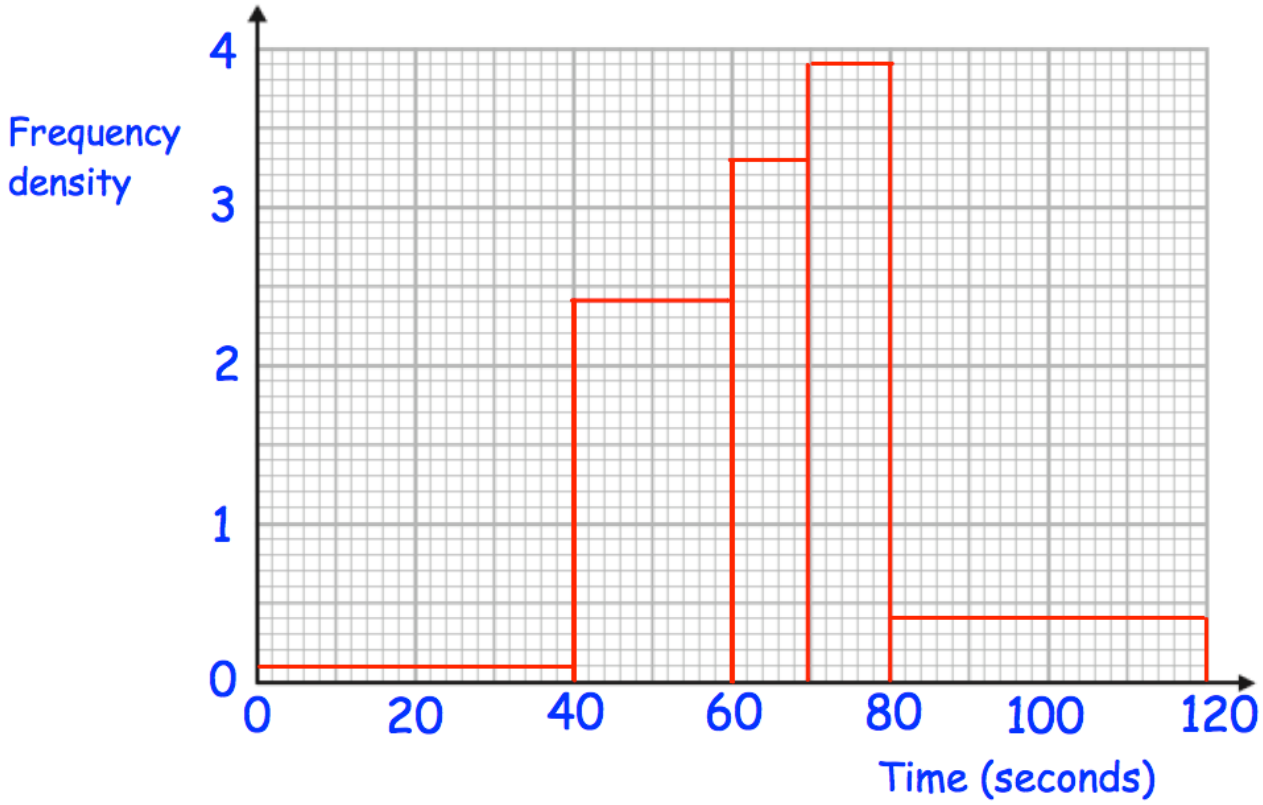
(c)



Condition: .....

(1)

52. The histograms shows information about the time taken by 140 students to complete a puzzle.



(a) Complete this frequency table.

Time, t seconds	Frequency
$0 < t \leq 40$	4
$40 < t \leq 60$	
$60 < t \leq 70$	33
$70 < t \leq 80$	
$80 < t \leq 120$	16

(2)

(b) Calculate an estimate of the median.

.....

(3)

53. A biased coin is flipped twice.

The probability of the coin landing on tails is 0.7

Find the probability the coin lands on heads twice.

.....

(2)

---

54. Timothy weighs the mass of some oranges, in grams.
The table shows some information about his results.

Mass	Frequency
$20 < m \leq 25$	12
$25 < m \leq 30$	24
$30 < m \leq 35$	17
$35 < m \leq 40$	15
$40 < m \leq 45$	4

Work out an estimate for the mean mass of an orange.

.....grams

(4)

55. 5 Year 10 students and 45 Year 11 students sit a test.

The mean mark for the whole group is 70
The mean mark for the Year 11 students is 72

Work out the mean mark for the Year 10 students.

.....

(2)

---

56. 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.

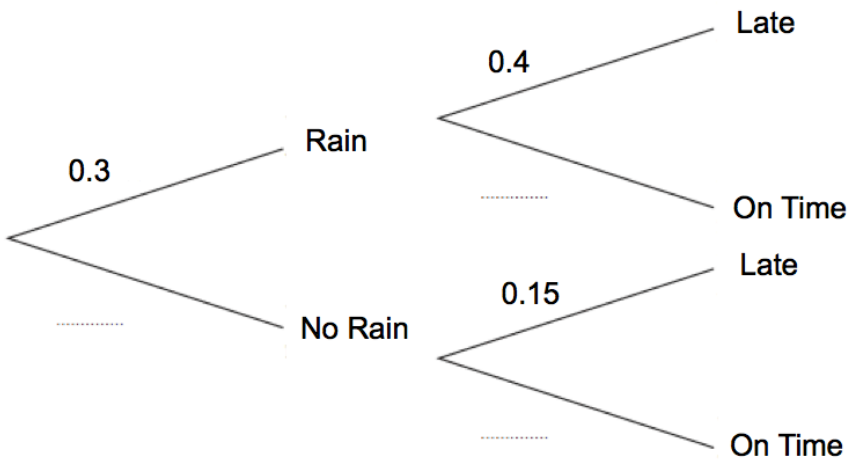
.....

(4)

57. In a small village, one bus arrives a day.

The probability of rain in the village is 0.3.
If it rains, the probability of a bus being late is 0.4.
If it does not rain, the probability of a bus being late is 0.15.

(a) Complete the tree diagram



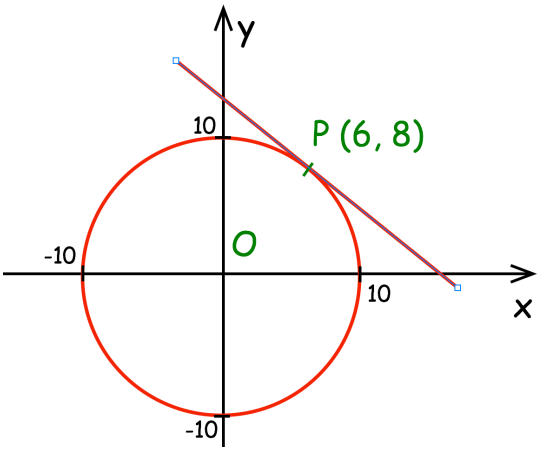
(2)

(b) Work out the number of days the bus should be late over a period of 80 days.

.....

(3)

58. Here is a circle, centre O, and the tangent to the circle at the point (6, 8).

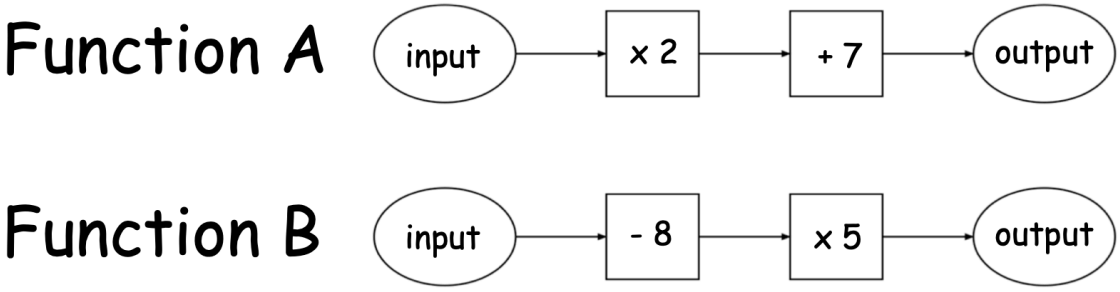


Find the equation of the tangent at the point P.

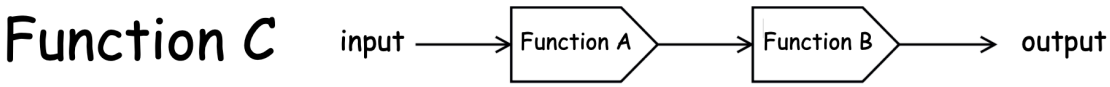
.....

(4)

59. Here are two functions.



Composite function C is shown below.



The output of function C is –25

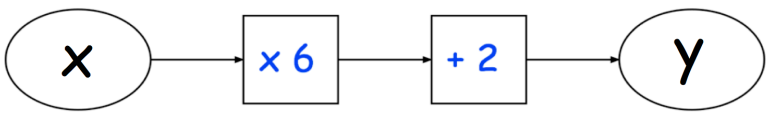
Work out the input.

.....

(2)

---

60. Here is a function



Find an algebraic expression for the output of the inverse of the function when the input is x.

.....

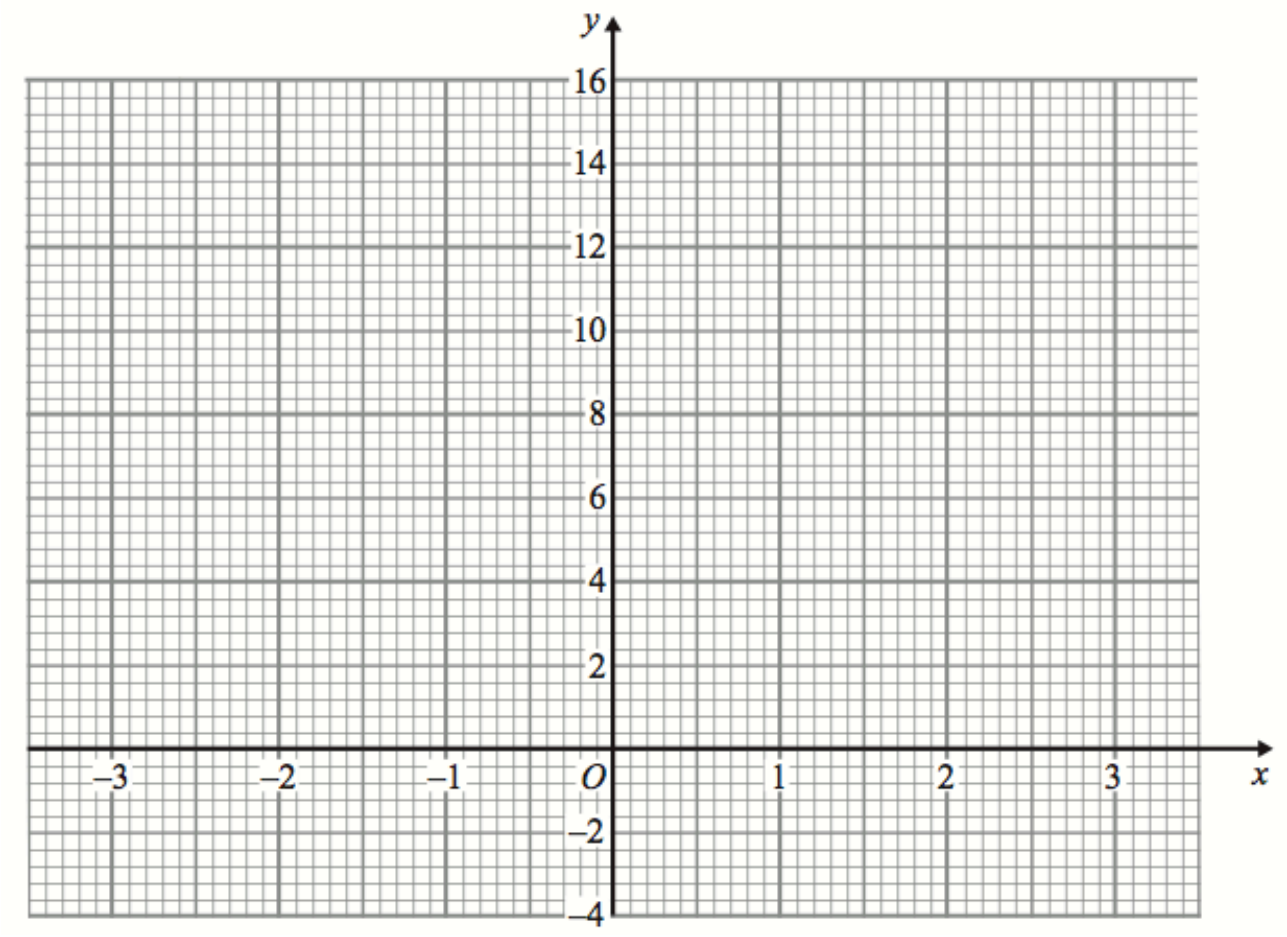
(2)

61. (a) Complete the table of values for $y = x^2 + 2x + 1$

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

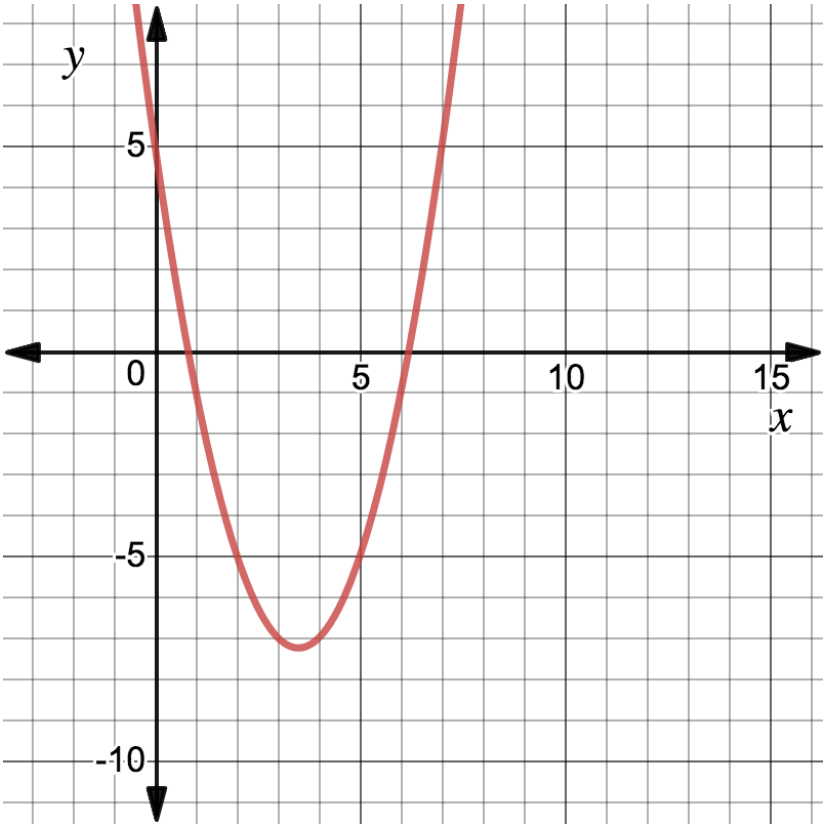
(2)

(b) On the grid, draw the graph of $y = x^2 + 2x + 1$ for the values of x from -3 to 3.



(2)

62. Shown below is the graph of $y = x^2 - 7x + 5$

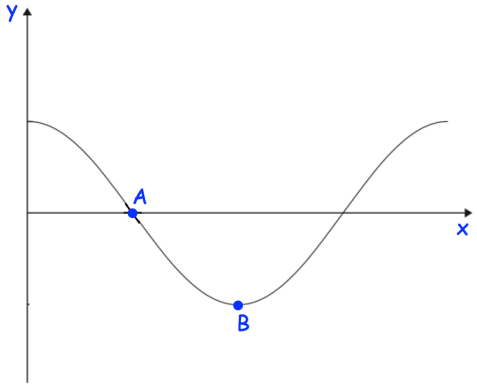


Use the graph to find estimates of the solutions of the equation
$x^2 - 7x + 5 = -3$

x = ... and x = ...

(2)

63. Here is the graph of $y = \cos x$



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

(..... , ...)

(1)

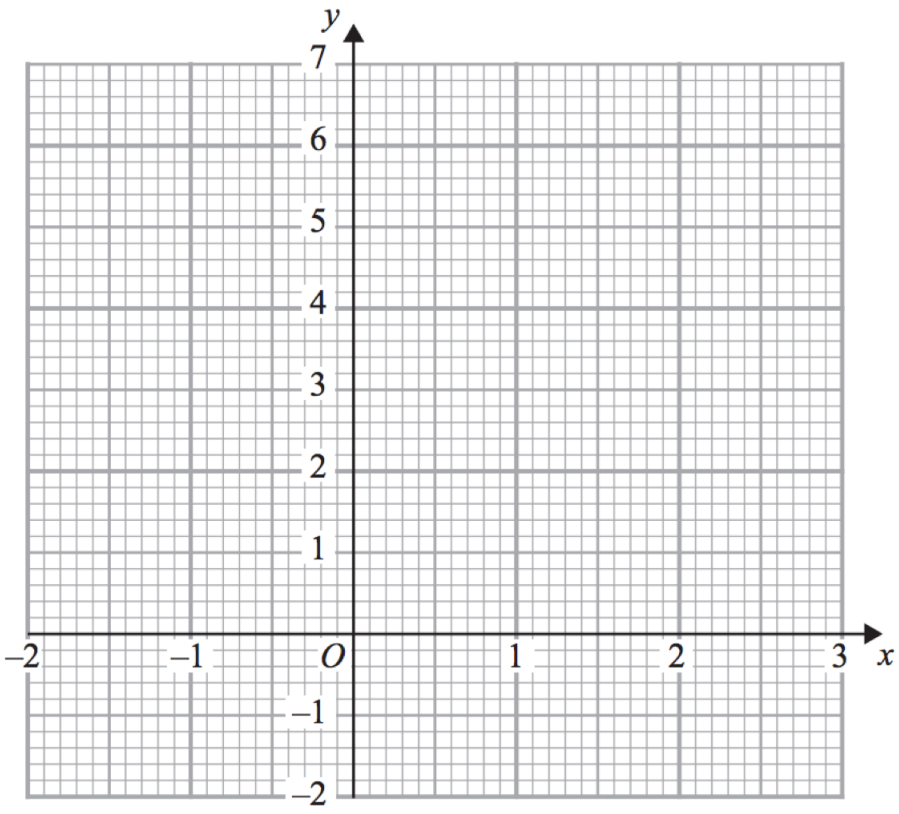
(b) Write down the coordinates of the point B.

(..... , ...)

(1)

---

64. On the grid, draw the graph of $y = x^3 - 2x + 3$ for the values of x, $-2 \leq x \leq 2$



(2)

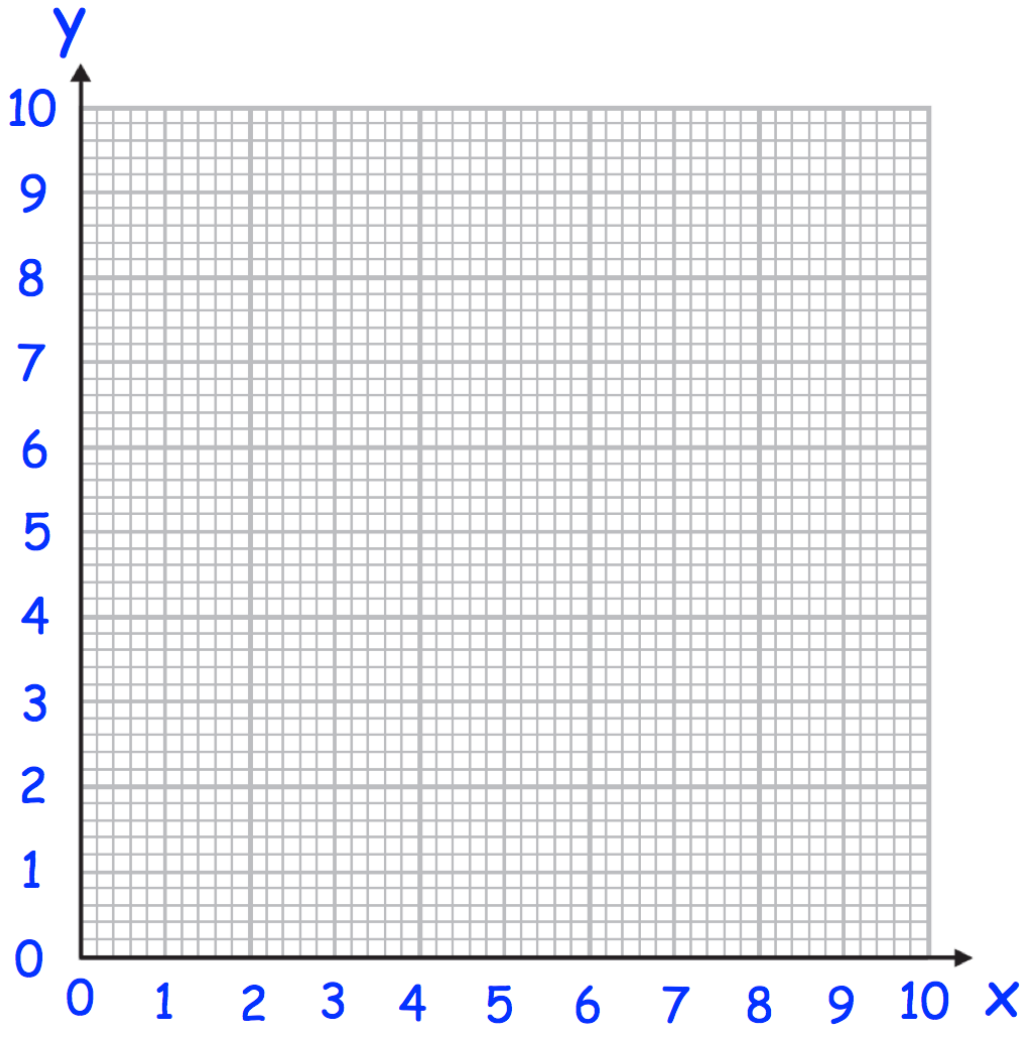
65.

(a) Complete the table of value for $y = \frac{4}{x}$

x	0.5	1	2	4	8	10
y						

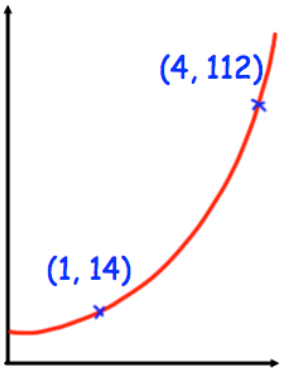
(2)

(b) On the grid, draw the graph of $y = \frac{4}{x}$ for $0.25 \leq x \leq 10$



(2)

66.



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 (1, 14) and (4, 112)

Calculate the value of a and b

a = ...

b = ...

(3)

67. S is a geometric sequence.

The first three terms of S are (x + 18), x and (2x – 15), where x is positive.

Find the value of x.

.....

(3)

---

68. Prove $(2n + 9)^2 – (2n + 5)^2$ is always a multiple of 4

(4)

---

69. Solve the equation $x^2 – 2x – 9 = 0$

Give your answers to two decimal places.

x = ... or x = ...

(3)

70. A curve has equation $y = x^2 - 6x - 17$

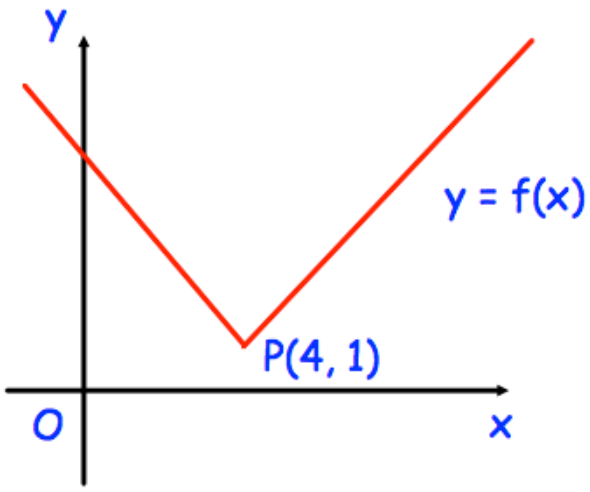
Work out the coordinates of the turning point by using completing the square.

.....

(3)

---

71. Here is the graph of y = f(x)
The point P(4, 1) is a point on the graph.



What are the coordinates of the new position of P when the graph y = f(x) is transformed to the graph of

(a) y = –f(x)

(..... , ...)

(1)

(b) y = f(x) + 4

(..... , ...)

(1)

72. Write down the reciprocal of 0.35

.....

(1)

---

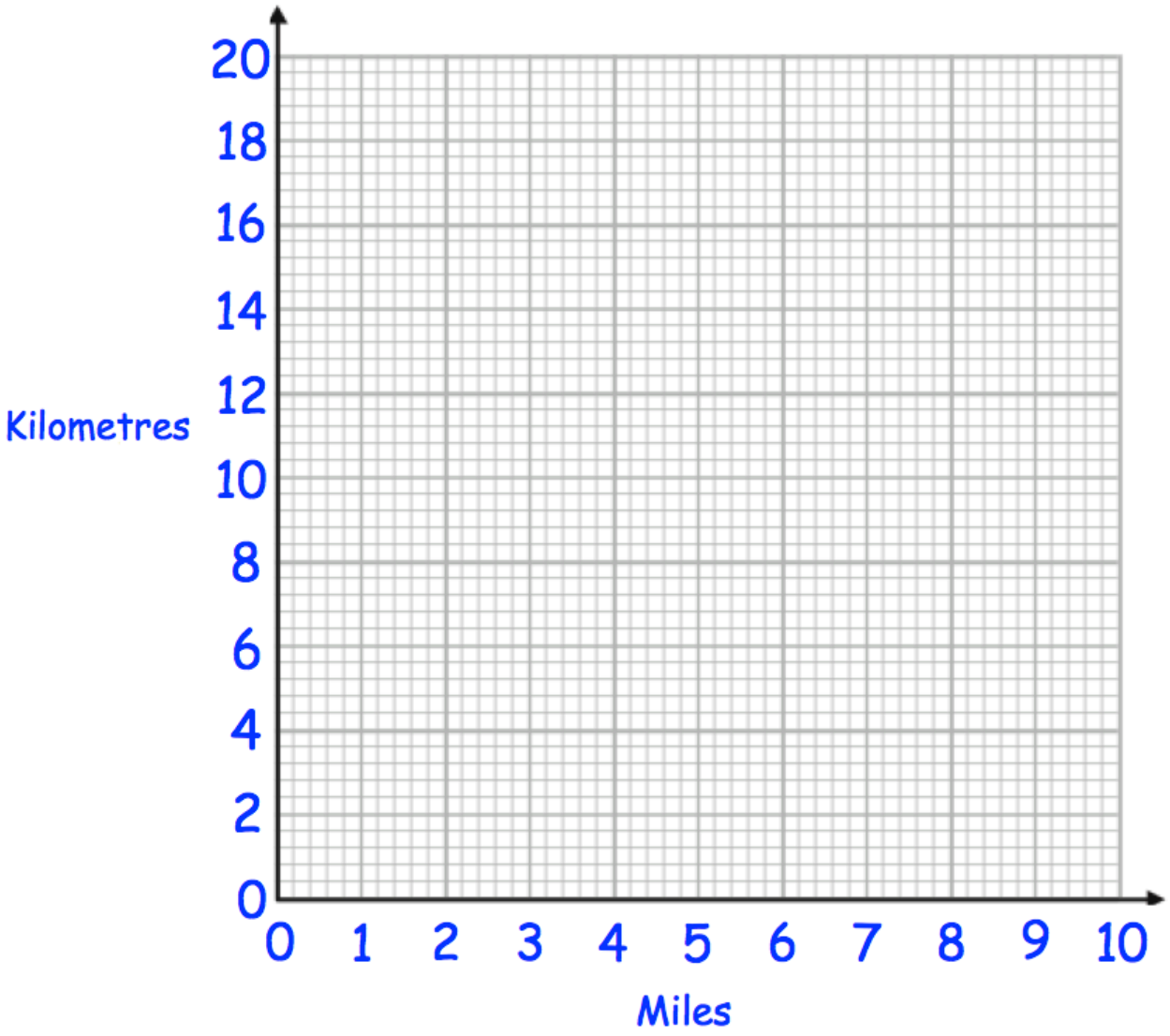
73. Use approximations to estimate the value of

$$\frac{596.4 \times 2.06}{0.521}$$

.....

(3)

74. (a) Use the fact 5 miles = 8 kilometres to draw a conversion graph on the grid.



(2)

Use your graph to convert

(b) 8 miles to kilometres

.....km

(1)

(c) 6 kilometres to miles

.....miles

(1)

75. (a) Write 5930000000 in standard form.

.....

(1)

(b) Write 8.024×10^{-4} as an ordinary number.

.....

(1)

(c) $c = 2 \times 10^6$ and $y = 6 \times 10^5$

$$w^2 = \frac{cy}{c - y}$$

Work out the value of w.
Give your answer in standard form correct to 2 significant figures.

.....

(3)

---

76. Nina invested £1500 for 4 years at 2.5% per annum simple interest.

Work out the total amount of money in the account at the end of 4 years.

£.....

(3)

77. y is directly proportional to the square of x.
When y = 24, x = 2.

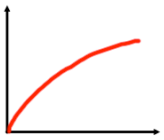
Find the value of y when x = 4.

y = ...

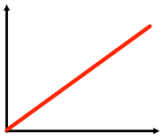
(3)

---

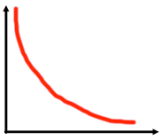
78. Match each graph to the correct relationship.



$y \propto \frac{1}{x}$



$y \propto \sqrt{x}$



$y \propto x$

(3)

---

79. It takes 6 hours for 20 workers to seed 40 acres.

How long would it take 10 workers to seed 90 acres?

.....

(3)

80. (a) Rationalise the denominator of

$$\frac{12}{\sqrt{3}}$$

.....

(2)

(b) Evaluate $\sqrt{2} \times \sqrt{32}$

.....

(2)

(c) Expand and simplify $(\sqrt{3} + \sqrt{5})^2$

.....

(2)

(d) Evaluate $(5 + \sqrt{2})(5 - \sqrt{2})$

.....

(2)

---

81. Simplify $9h + 5k + 4h - 8k$

.....

(2)

82. Factorise fully

$$w^2y + wy^2$$

.....

(2)

---

83. (a) Factorise $y^2 - 13y + 36$

.....

(2)

(b) Factorise $2w^2 - 9w + 4$

.....

(2)

---

84. $v = u + at$

Work out a when $v = 62$, $u = 250$ and $t = 8$

.....

(3)

---

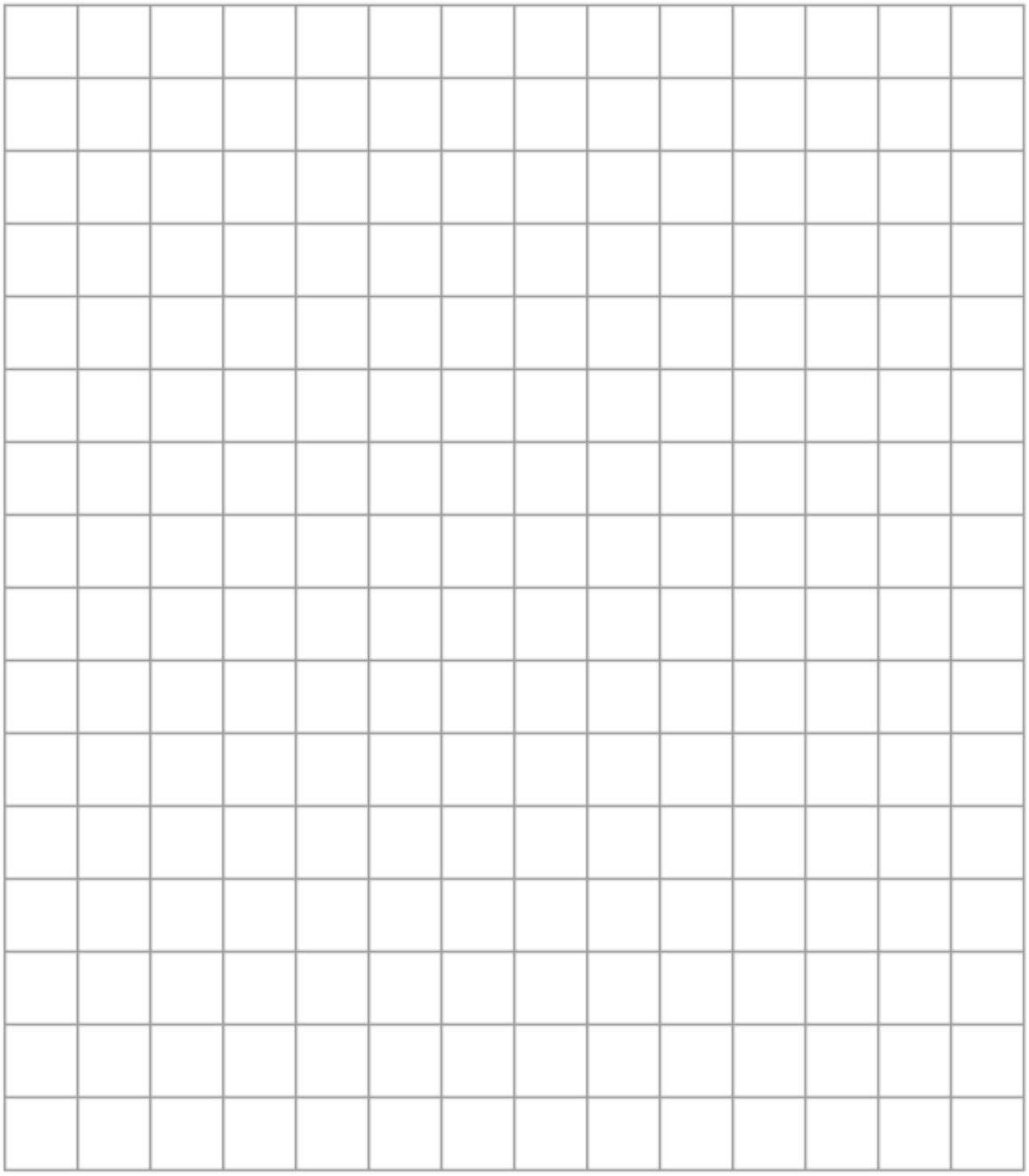
85. x is an integer.

Write down all the solutions of the inequality $30 < 7x + 1 < 135$

.....

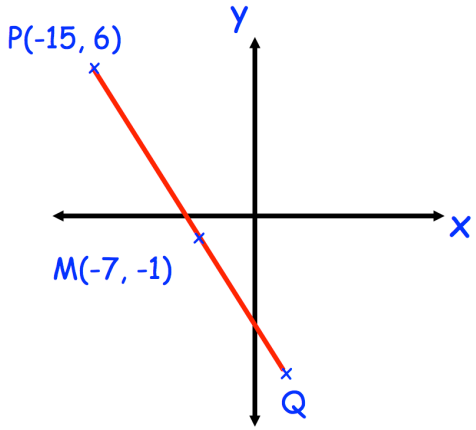
(3)

86. On the grid, draw $x + 2y = 6$ for values of x from -2 to 2.



(4)

87.



M is the midpoint of l

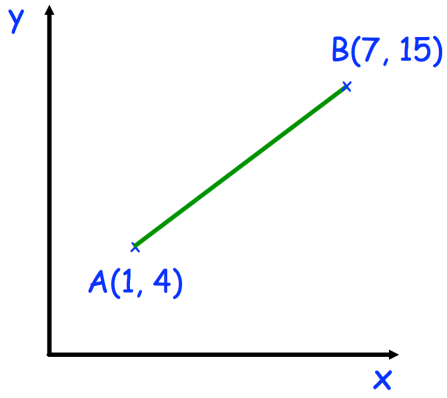
Write down the coordinates of the point Q.

.....

(2)

---

88. Shown below are the points A(1, 4) and B(7, 15)

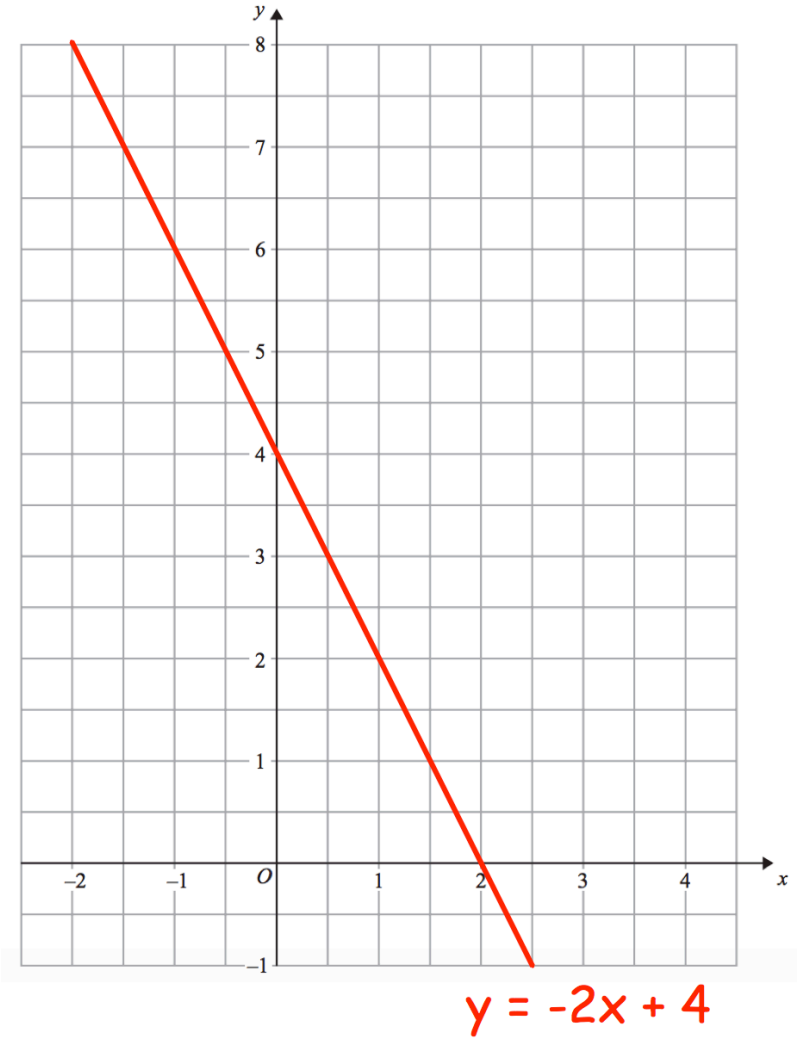


Calculate the length of the line joining A and B.

.....

(2)

89. The straight line y = –2x + 4 has been drawn on the grid.



(a) On the same grid, draw the graph of y = x + 1

(2)

(b) Use the graphs to solve the simultaneous equations

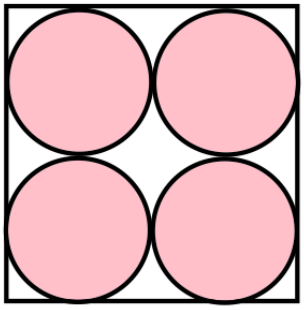
$$y = -2x + 4$$

$$y = x + 1$$

.....

(2)

90. A logo is designed that has four pink circles within a white square.



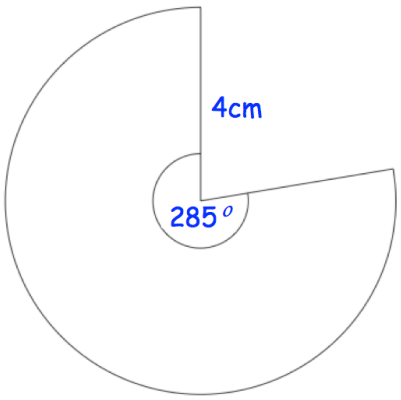
The square has side length 16cm.

Find the area of the logo that is white.

.....cm²

(5)

91.

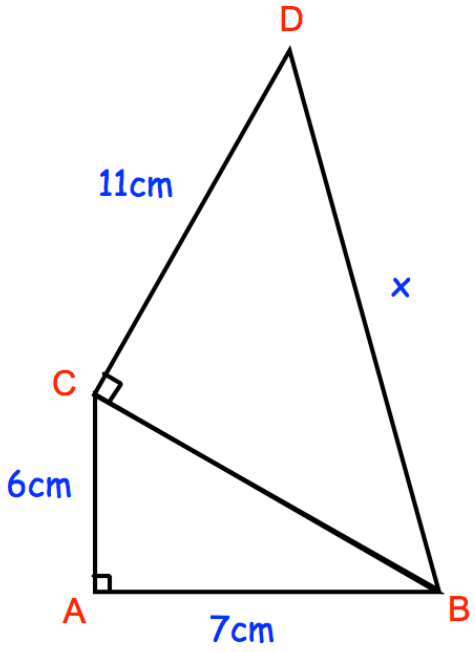


Calculate the perimeter of the sector.

.....cm

(3)

92. Below are two triangles, ABC and BCD.



Find x

.....cm

(4)

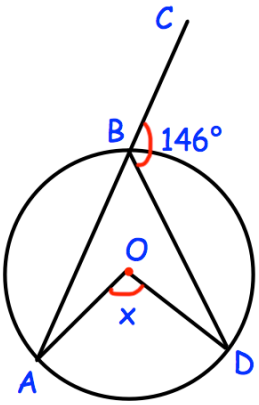
---

93. Convert 552 cm² into m²

..... m²

(1)

94.



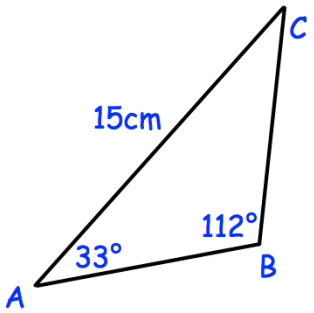
Shown is a circle with centre O.
ABC is a straight line.
Angle CBD is 146°

Find the size of angle AOD.

.....°

(3)

95.



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

Work out the length of BC.

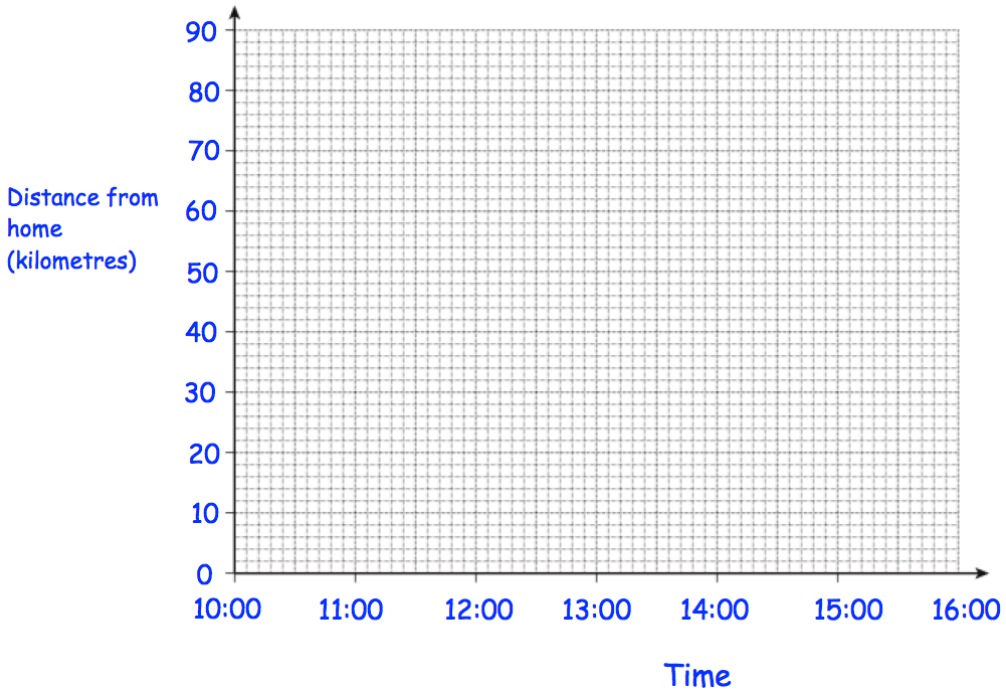
.....cm

(3)

96. Bethany drove to a family meal and then back home.
The meal was at a restaurant that is 70 kilometres from her home.

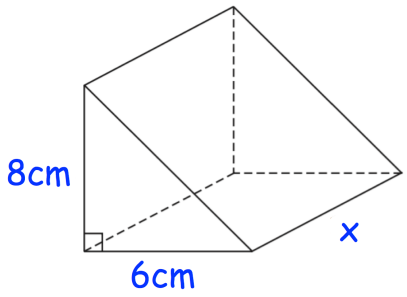
Bethany left home at 10:00 and arrived at the restaurant at 11:30.
She stayed at the family meal for 2 hours.
Bethany then drove home at a speed of 35 kilometres per hour.

Show this information on the distance-time graph.



(3)

97. The diagram shows a solid triangular prism.



The prism is made from wood and has a mass of 643.8g
The density of wood is 1.85g/cm³

Calculate the length of the prism.

……..cm
(4)

---

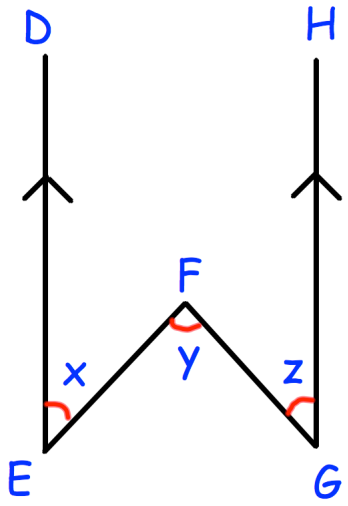
98. An object is placed on a table.
It exerts a force of 22 newtons on the table.

The pressure on the table is 500 newtons/m²

Calculate the area of the crate that is in contact with the table.
Include suitable units.

……..
(3)

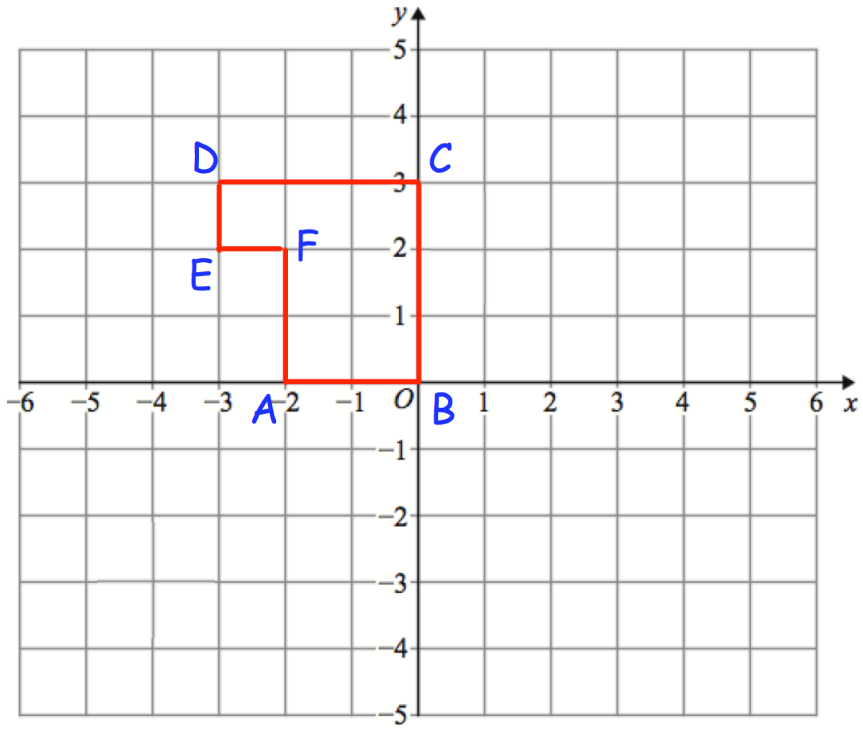
99. In the diagram below, the lines ED and GH are parallel.



Prove that $x + z = y$

(3)

100. Here is shape ABCDEF



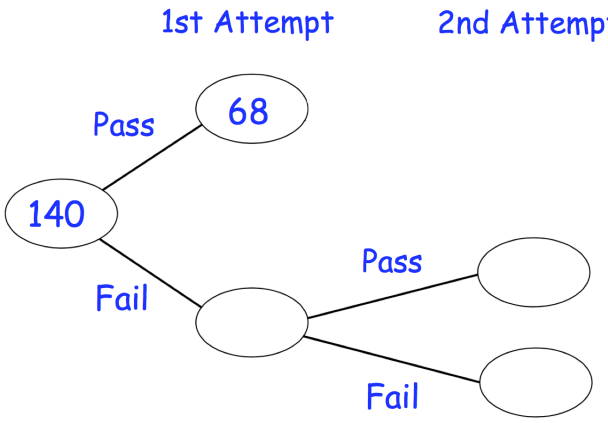
Describe fully a **single** transformation so that only vertex F is invariant.

……

……

……

101. 140 students sign up for a college course.
At the end of the course, each student has two attempts to pass a test.
If a student passes either attempt, they are awarded a certificate



85% of the students receive a certificate.

Work out how many students passed the test in their 2nd attempt.

(3)

102. 100 students study one language at a college.

Some students study French.
Some students study Spanish.
The rest of the students study German.

54 of the students are in Year 12.
20 of the 29 students who study Spanish are in Year 13.
31 students study German.
15 Year 13 students study French.

Work out the number of Year 12 students who study German.

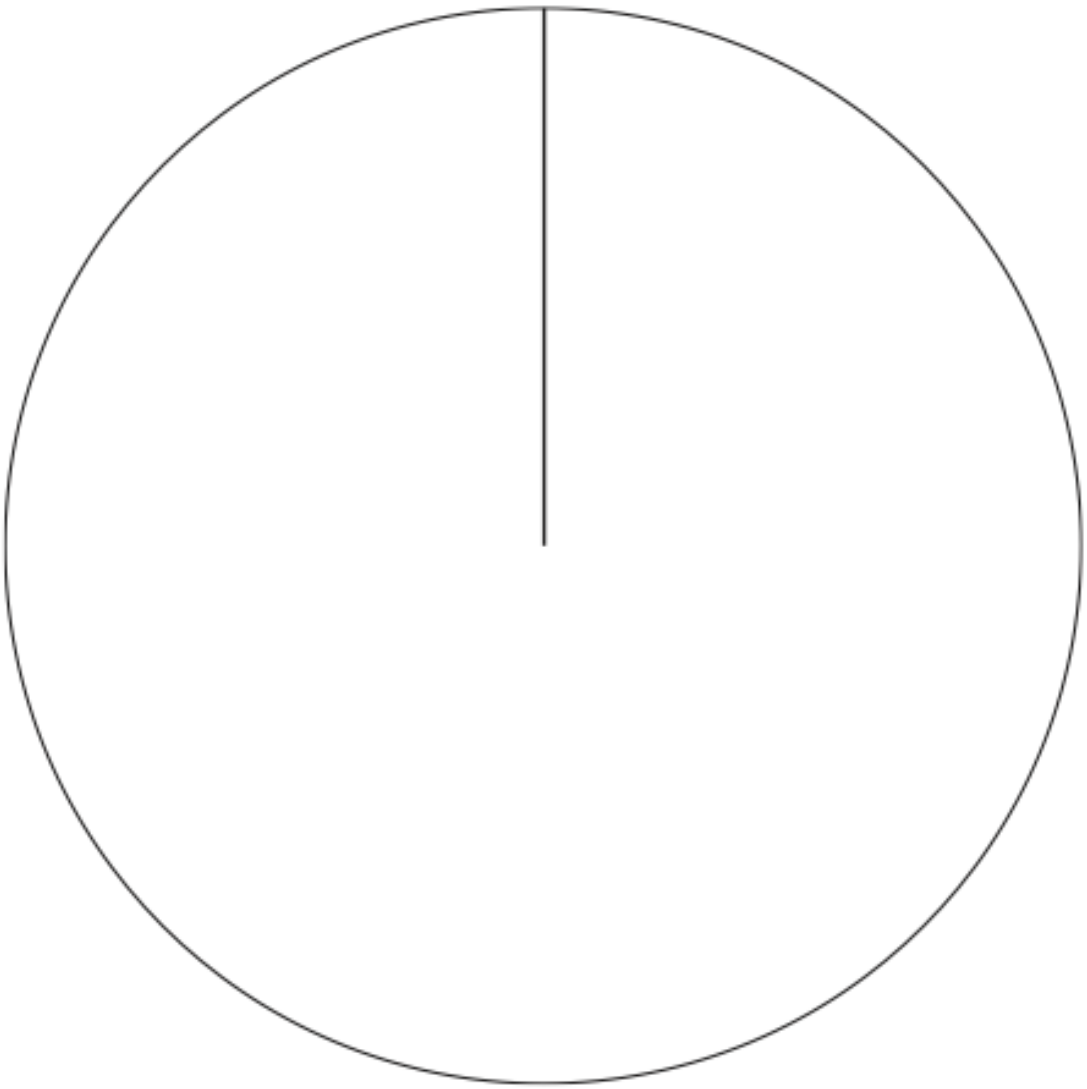
.....

(4)

103. The table gives information about the number of students in years 7 to 10.

Year	Frequency
7	200
8	140
9	220
10	160

Draw an accurate pie chart to show this information.

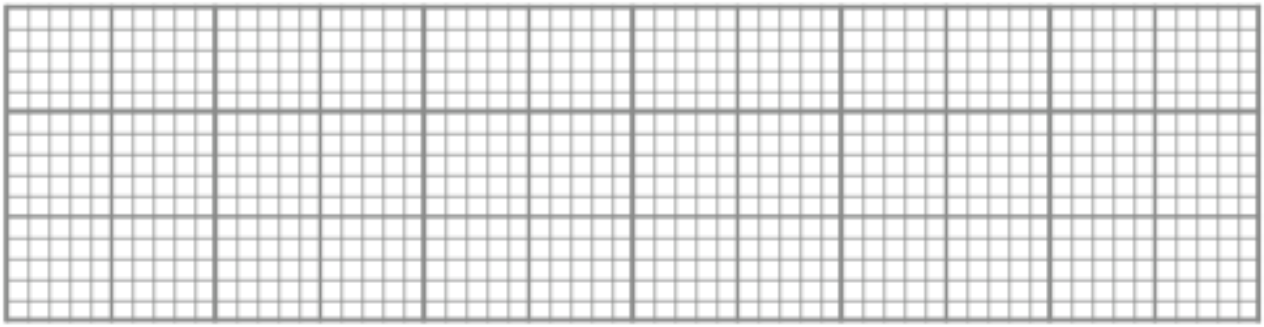


(4)

104. The table gives information about the weights of 50 rugby players for Team A

Lowest	68kg
Lower Quartile	74kg
Median	82kg
Upper Quartile	88kg
Highest	100kg

(a) Draw a box plot to show this information.

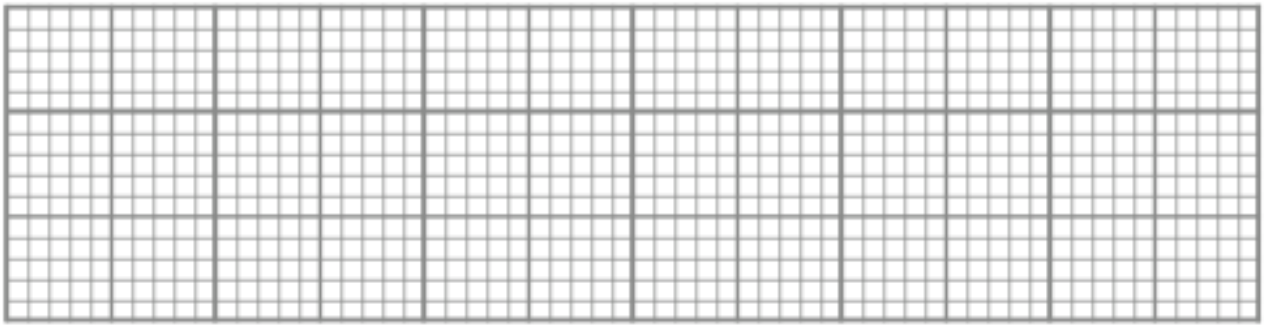


(3)

The weights of 50 rugby players for Team B are also recorded.

The lightest rugby player for Team B is 51kg.
The lower quartile is 60kg.
The median is 71kg.
The range and interquartile range for the rugby players in Team B is the same as the rugby players in Team A.

(b) Draw a box plot to show this information.



(3)

105. A manager recorded how long each customer spent in his supermarket.
The table shows his results.

Time, t (minutes)	Frequency
$0 < t \leq 10$	24
$10 < t \leq 20$	31
$20 < t \leq 30$	50
$30 < t \leq 40$	35
$40 < t \leq 50$	60

Which class interval contains the median?

.....

(1)

---

106. The table shows the number of pages in 100 books.

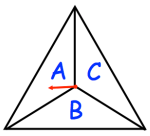
Number of pages, x	Frequency
$0 < x \leq 100$	7
$100 < x \leq 200$	25
$200 < x \leq 300$	40
$300 < x \leq 400$	12
$400 < x \leq 500$	16

Write down the modal class interval.

.....

(1)

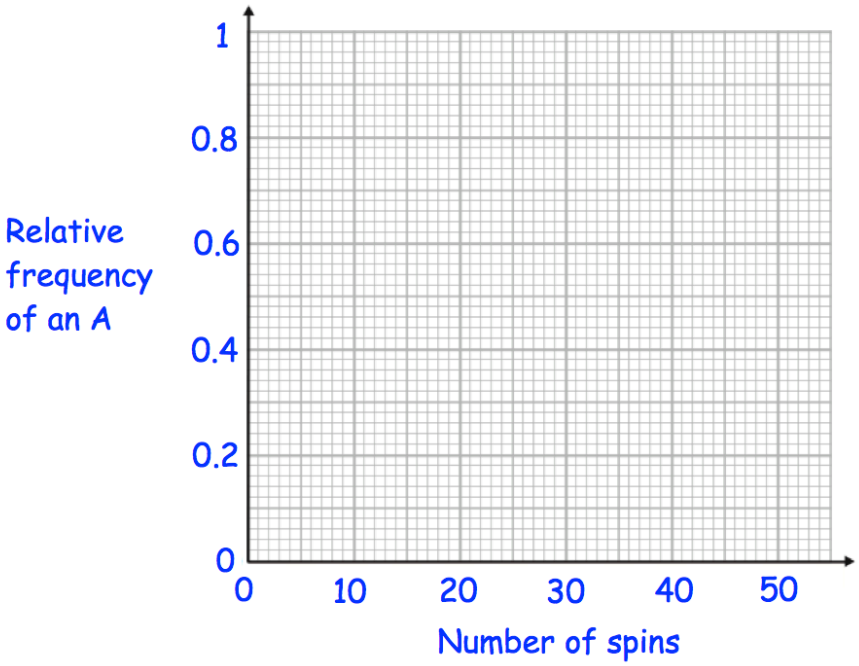
107. A three-sided spinner is labelled A, B and C.



The spinner is spun and the frequency the letter A is recorded every 10 spins.
The table below shows this information.

Spins	10	20	30	40
Frequency of an A	5	12	21	26

(a) Complete plot the relative frequencies on the graph below.



(3)

(b) Neil says the relative frequency after 50 spins is 0.8
Explain why Neil must be wrong

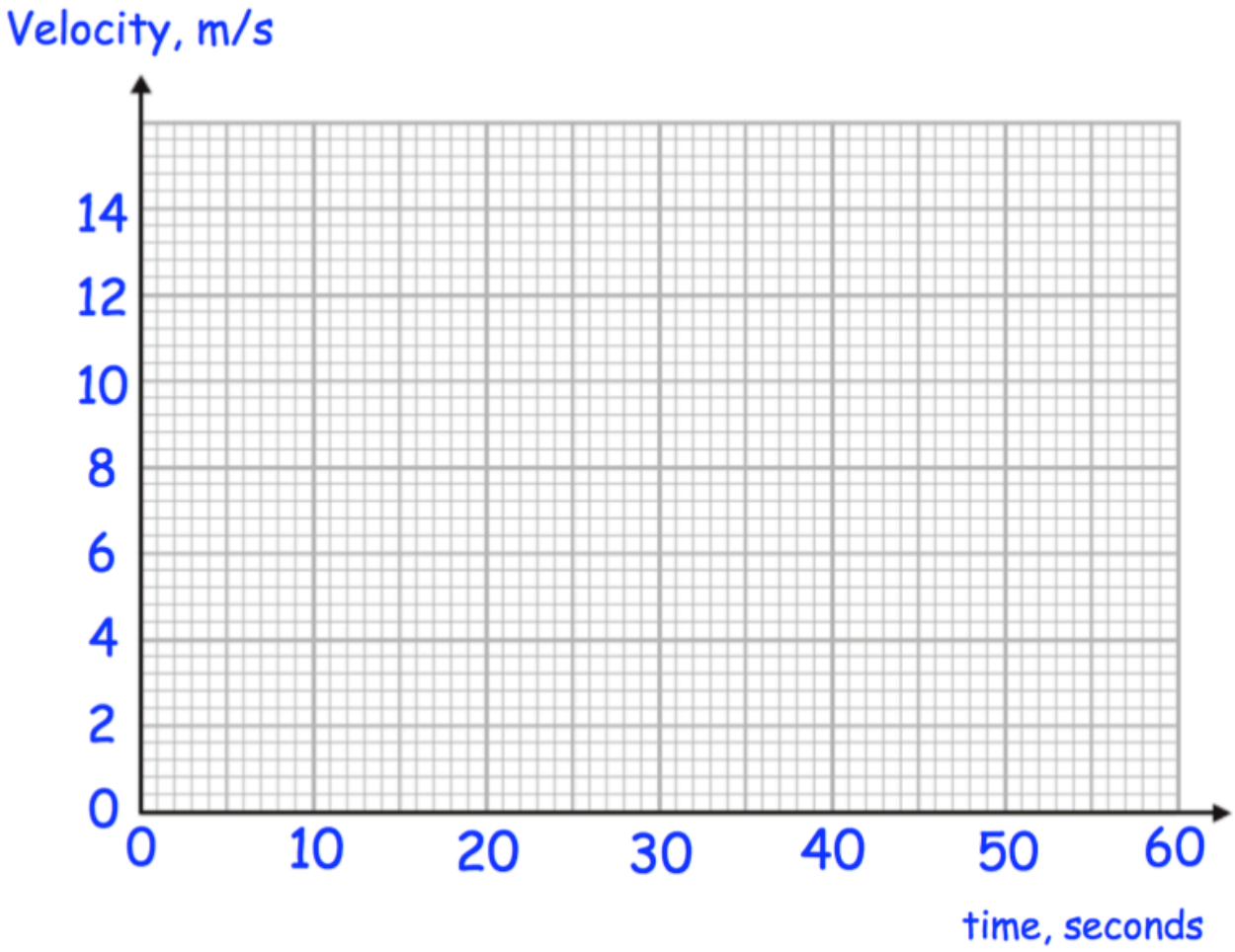
.....

.....

(2)

108. A remote control car drives in a straight line.
It starts from rest and travels with constant acceleration for 20 seconds reaching a velocity of 12m/s.
It then travels at a constant speed for 20 seconds.
It then slows down with constant deceleration of 4m/s^2.

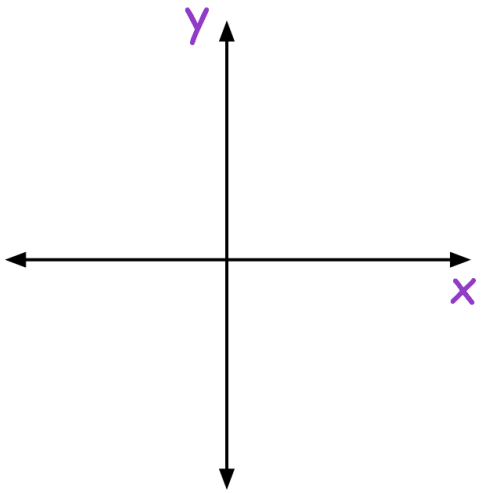
(a) Draw a velocity time graph



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

……..m
(2)

109. Sketch the graph of $y = x^2 + 7x - 8$



(3)

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110. $9x^3 + (x + a)(x + b) + cx \equiv ax^3 + x^3 + x^2 + 12x - 24$

Work out the values of a, b and c.

a = ...

b = ...

c = ...

(3)