Paper 2 and Paper 3 Preparation Paper

OCR Foundation

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	Angle Facts	35,30,34,39
2	Angles in Polygons	32
3	Bearings	26,27,27a,27b
4	Perimeter	241
5	Line Symmetry	316
6	Rotational Symmetry	317
7	Constructions	72,78,83
8	Loci	75,76,77
9	Faces, Edges, Vertices	5,3
10	Nets	4
11	Views and Elevations	354
12	Time Calculations	322
13	Timetables	320
14	Speed, Distance, Time	299
15	Parts of the Circle	61
16	Circumference	60,243
17	Area of a Circle	59
18	Arc length	58
19	Area of a Sector	46
20	Volume of a Cylinder	357
21	Trigonometry	329,330,332
22	Volume of a Cuboid/Prism	355,356
23	Volume of a Cone/Sphere	359,361
24	Surface Area	310
25	Surface area of Sphere/Cone	313,314
26	Vectors	353a,353
27	Multiplication	199,200

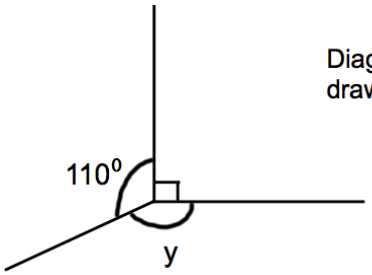
Question	Topic	Video number
28	Division	98
29	Addition	6
30	Subtraction	304
31	Rounding	276,277a,277b,278,280
32	Estimation	215
33	Order of Operations	211
34	Ordering Decimals	95
35	Arithmetic with Decimals	90,91,92,93,94
36	Product of Primes	223
37	LCM/HCF	218,219,224
38	Standard Form	300,302,303
39	Adding Fractions	133
40	Multiplying Fractions	132
41	Dividing Fractions	134
42	Fractions, Decimals, Percentages	121 to 129
43	Percentage Change	233
44	Simple Interest	236a
45	Compound Interest	236
46	Reverse Percentages	240
47	Currency	214a
48	Recipes	256
49	Negative Numbers	205-209
50	Money	400
51	Frequency Trees	376
52	Two-way Tables	319
53	Pictograms	161,162
54	Probability	245,246,248
55	Scatter Graphs	165 - 168
56	Venn Diagrams	380
57	Tree Diagrams	252

Question	Topic	Video number
58	Reading Tables	387
59	Collecting Like Terms	9
60	Laws of Indices	174
61	Expanding Brackets	13
62	Factorising	117
63	Factorising Quadratics	118,120
64	Solving Equations	110,113,266
65	Drawing Linear Graphs	186
66	y = mx + c	191
67	Gradient	189
68	Real Life Graphs	171a
69	Parallel graphs	196
70	Changing the Subject	7
71	Quadratic graphs	264
Other Unseen Topics (or usually more prominent)		
72	Types of Angle	38
73	Angles in Parallel Lines	25
74	Angles in a Triangle	37
75	Angles in a Quadrilateral	33
76	Area of Rectangles	45
77	Units	347,349
78	Sensible Estimates	285
79	Distance Charts	318
80	Travel Graphs	171
81	Density	384
82	Pressure	385
83	Translations	325, 326
84	Reflections	272, 273
85	Rotations	275
86	Exact Trig Values	341

Question	Topic	Video number
87	Similar Shapes (sides)	292
88	Congruent Triangles	67
89	Factors	216
90	Prime Numbers	225
91	Square Numbers and Square Roots	226,228
92	Cube Numbers and Cube Roots	212,214
93	Indices	172
94	Negative Indices	175
95	Fractions of Amounts	137
96	Reciprocals	145
97	Expressing as Fraction or %	136,237
98	Percentages of Amounts	234,235,238
99	Ratio	269,270,271
100	Place Value	222,22a
101	Error Intervals	377
102	Proportion	255a, 254
103	Tally Charts	321
104	Line Graphs	160
105	Relative Frequency	248
106	Averages & Range	56,50,53,57
107	Mode: Frequency Table	56a
108	Median: Frequency Table	51
109	Combined Mean	53a
110	Estimated Mean	55
111	Samples	281a
112	Bar Charts	147,148
113	Function Machines	386
114	Writing Expressions	16
115	Multiplying & Dividing Terms	18,11
116	Geometric Progressions	375

Question	Topic	Video number
117	The nth Term	288
118	Forming Equations	114,115
119	Conversion Graphs	151
120	Cubic Graphs	344
121	Reciprocal Graphs	346
Seen Topics (remember they may still appear, so they may be worthwhile recapping)		
See website	Use of a Calculator	352
See website	Scales & Maps	283
See website	Area of Parallelogram/Trapezium	44,48
See website	Enlargements	104,105,107
See website	Pythagoras	257
See website	Area of a Triangle	49
See website	Multiples	220
See website	Pie Charts	163,164
See website	Listing Outcomes	253
See website	Sequences	286,287,290,287a
See website	Inequalities	177,178,179
See website	Substitution	20
See website	Simultaneous Equations	295,297

1.



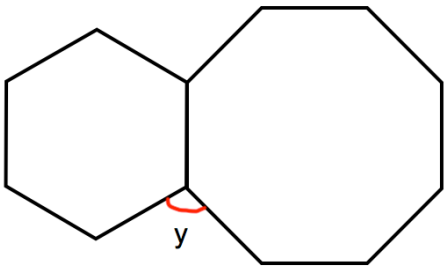
Work out the size of the angle marked y.

.....°

(1)

---

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

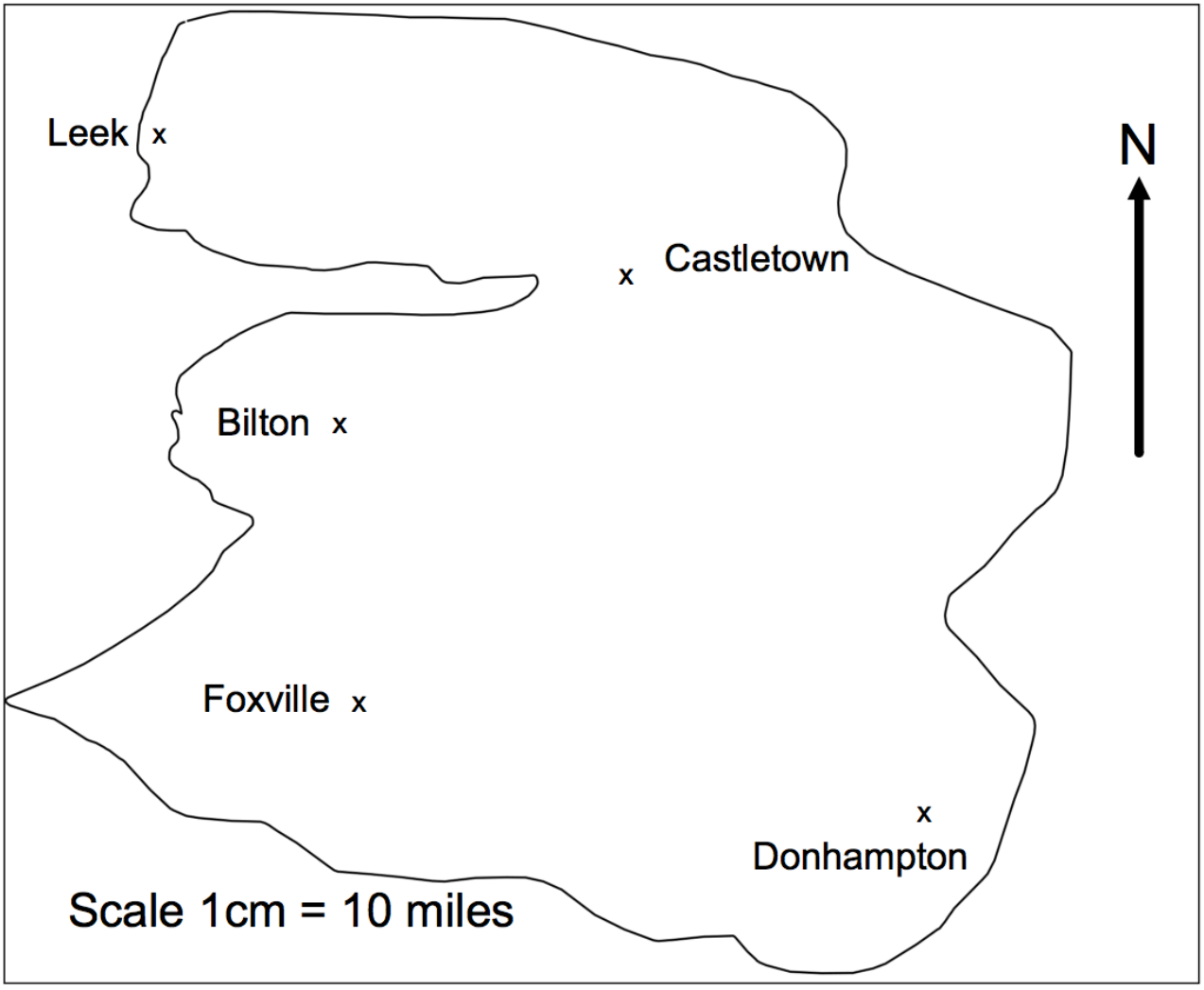


Calculate the size of angle y.

y = ...°

(3)

3. This is a map of an island.



A helicopter flies in a straight line from Leek to Donhampton.

(a) How far does the helicopter fly?

.....miles
(2)

(b) Write down the bearing of Donhampton from Leek.

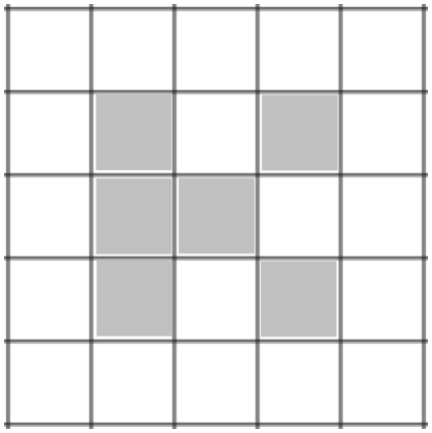
.....°
(1)

4. The perimeter of a parallelogram is 17cm.
The length of each long side is 5cm.

Work out the length of each short side.

.....cm
(2)

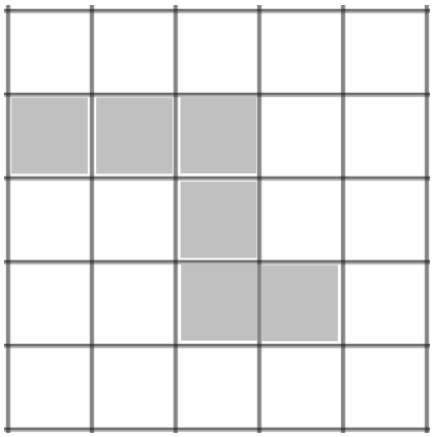
5.



Shade one more square to make a pattern with 1 line of symmetry.

(1)

6.



Shade one more square to make a pattern with rotational symmetry order 2.

(1)

---

7. Use ruler and compasses to construct the perpendicular bisector of AB.
You **must** show clearly all your construction arcs.

(2)

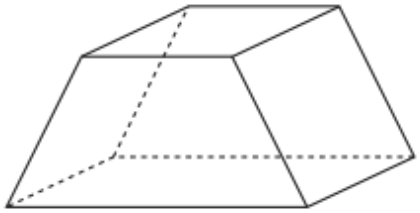
8. The diagram shows two lighthouses.

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)

9. Below is a solid.



(a) Write down the number of faces

.....

(1)

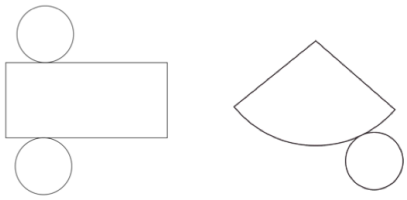
(b) Write down the number of vertices

.....

(1)

---

10. Below are the nets of two solid shapes.



A B

(a) Write down the shape that is made from Net A.

.....

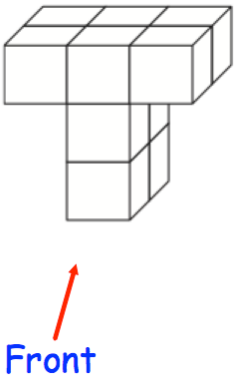
(1)

(b) Write down the shape that is made from Net B.

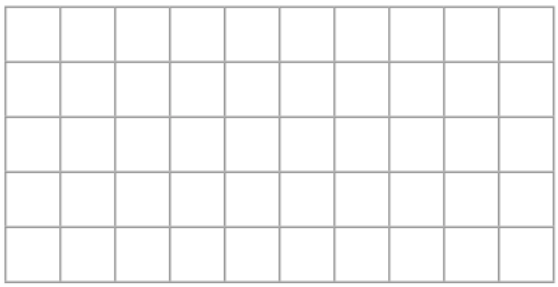
.....

(1)

11. Shown below is a solid shape made from centimetre cubes.

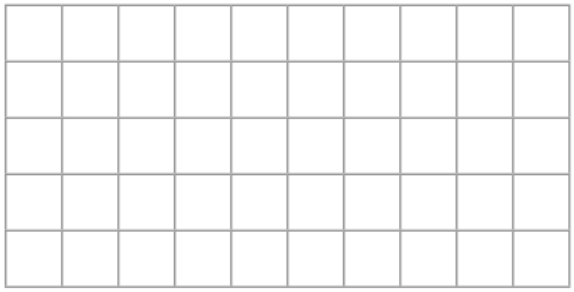


(a) On the centimetre square grid, draw the front elevation.



(2)

(b) On the centimetre square grid, draw the plan view.



(2)

---

12. Connor's watch is 17 minutes slow
Joseph's watch is 5 minutes fast

The time on Joseph's watch is 19:01

What time is shown on Connor's watch?

.....

(1)

13. Here is part of a timetable for a bus.

Southville	09 18	10 38	12 05
Leek	09 28	10 48	-------
Milton	09 41	11 01	-------
Newtown	09 49	11 09	-------
Red Island	09 55	11 15	12 36
Sandville	10 13	11 33	-------
Bakerstown	10 31	11 51	13 00

A bus leaves Southville at 10 38

(a) At what time should the bus arrive at Newtown?

.....
(1)

(b) How long will the journey take?

.....minutes
(1)

James arrives at the Milton bus stop at 09 29.
He waits for the next bus to Red Island.

(c) (i) How many minutes should he wait?

.....minutes
(1)

(ii) At what time should James arrive at Red Island?

.....
(1)

Sally wants to travel from Southville to Bakerstown.
The 12 05 is an 'express' bus.

(d) How many minutes shorter is the journey if she takes the 'express bus?'

.....minutes
(2)

14. The distance from Leek to Milton is 310 miles.
A train travels this distance in 4 hours 15 minutes.

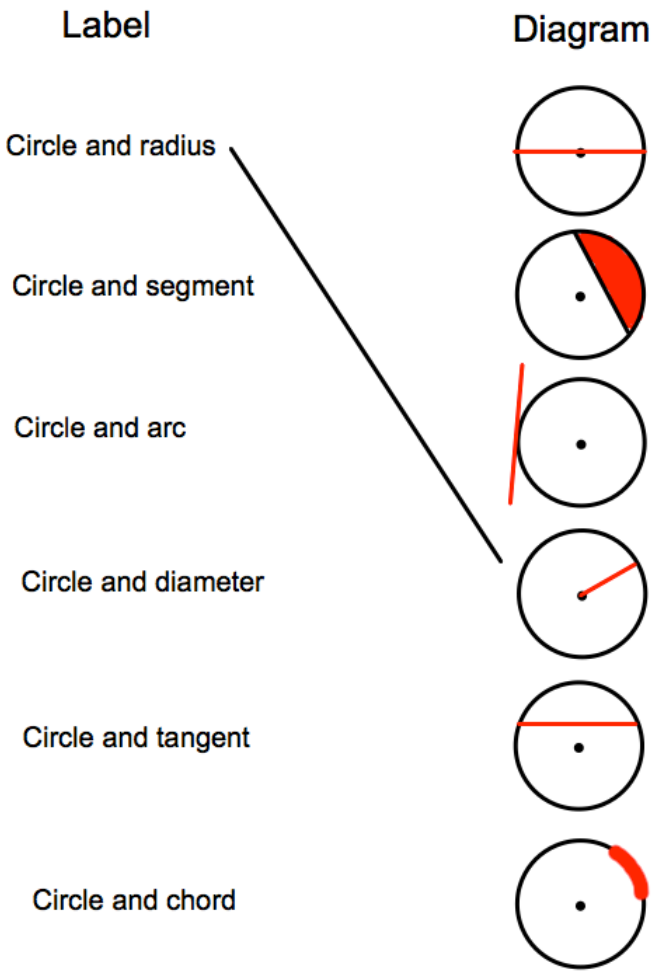
Calculate the average speed of the train.

.....mph
(3)

---

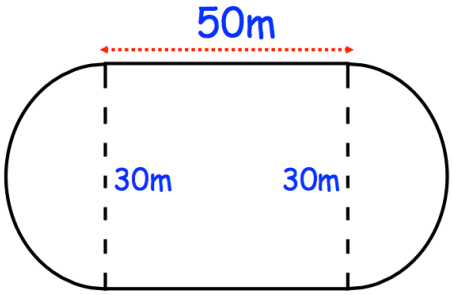
15. Here are 6 diagrams and 6 labels.
In the diagram the centre of the circle is shown with a dot.

Match each diagram to its label.
One has been done for you.



(4)

16. A primary school has a running track.
It has two straights of 50 metres.
Also there are two 'bends' that are semicircles with diameter 30 metres.

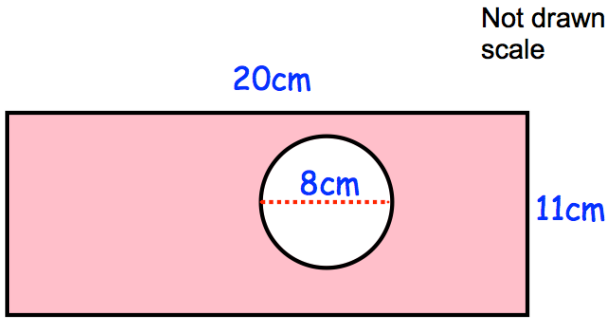


Work out the distance around the running track.

.....m
(4)

---

17. The diagram shows a rectangle with a circle cut out.

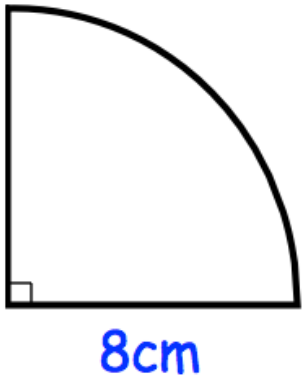


The rectangle has length 20cm and width 11cm.
The circle has diameter 8cm.

Work out the shaded area.
Give your answer correct to 2 decimal places.

.....cm²
(4)

18.

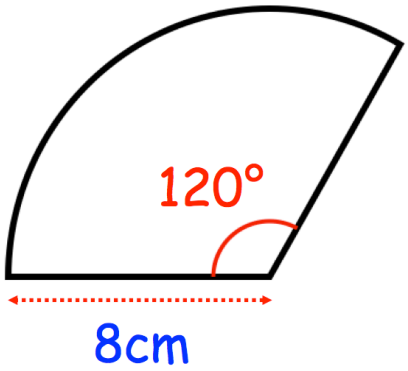


Calculate the perimeter of the sector.

.....cm

(2)

19.

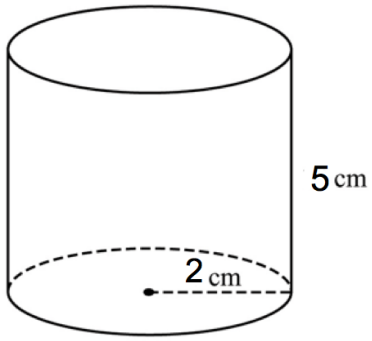


Calculate the area of the sector.

.....cm²

(2)

20. Below is a cylinder with radius 2cm and height 5cm.



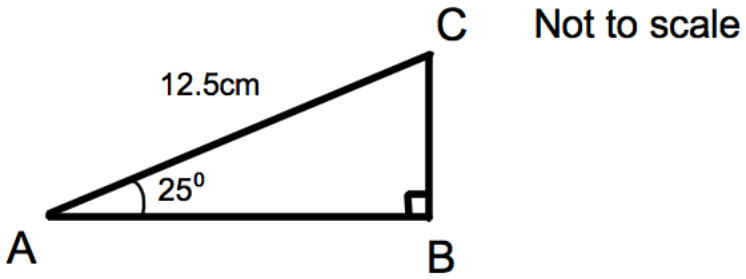
Calculate the volume of the cylinder.

.....cm³

(3)

---

21. Triangle ABC has a right angle.
Angle BAC is 25^0
AC = 12.5cm

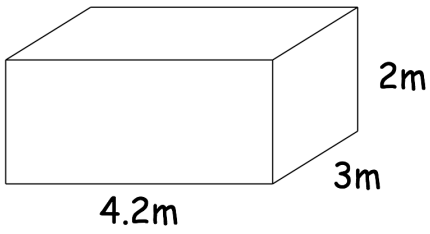


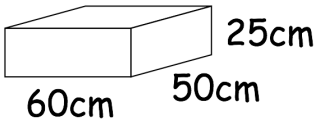
Calculate the length of AB

.....cm

(3)

22. A store room measures 4.2m × 3m × 2m
A box measures 60cm × 50cm × 25cm





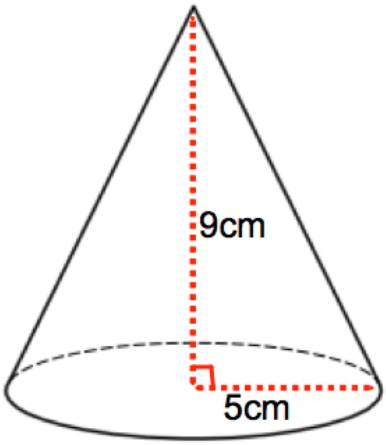
Work out the greatest number of boxes that can be stored in the store room.

.....

(3)

---

23. A cone has base radius 5cm and perpendicular height 9cm.

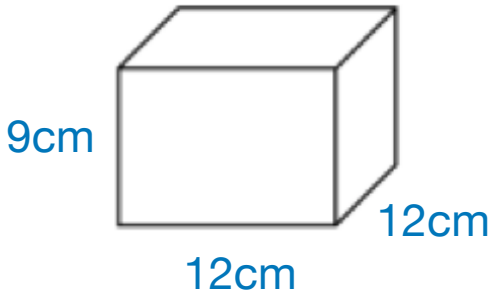


Work out the volume of the cone.

.....cm³

(3)

24.



Work out the surface area of this cuboid.
State the units of your answer.

.....

(3)

---

25. A sphere has a radius of 5cm.

Calculate the surface area of the sphere.

.....

(3)

26. Given

$$\mathbf{a} = \begin{pmatrix} 6 \\ -4 \end{pmatrix} \quad \mathbf{b} = \begin{pmatrix} -2 \\ 1 \end{pmatrix}$$

Work out $3\mathbf{a} - \mathbf{b}$

.....

(3)

---

27. A theatre has 46 rows.
There are 42 seats in each row.

During a show at the theatre, there are 50 empty seats.

Work out how many people are watching the show.

.....

(3)

---

28. Paul has £10 to buy rulers at 60p each.

What change should he get if he buys as many as possible?

.....

(3)

29. The table below shows how many washing machines and dishwashers were sold by a shop over three months.

	Washing Machines	Dishwashers
April	92	65
May	70	72
June	104	68

Work out how many more washing machines than dishwashers were sold in total over the three months.

.....

(3)

30. Find the missing numbers below.

$$\begin{array}{r} \square\,2\,4 \\ -\,1\,5\,\square \\ \hline 6\,\square\,9 \end{array}$$

(2)

31. Holly works out the answer to 135.66 + 193.88 on a calculator.

Her answer is 329.54

(a) Round her answer to the nearest 10.

.....

(1)

(b) Round her answer to the nearest 100.

.....

(1)

(c) Round her answer to the nearest integer.

.....

(1)

(d) Round her answer to one decimal place.

.....

(1)

---

32. Use approximations to estimate the value of

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

.....

(3)

33. Given

$a = 11 - 3^2$ $\quad$ $b = \dfrac{60}{2+3}$ $\quad$ $c = 18 - 3 \times 2 + 1$

Work out the value of $a + b + c$

.....

(4)

---

34. Write these numbers in order of size.
Start with the smallest number.

0.92 $\quad$ 0.901 $\quad$ 0.99 $\quad$ 0.099 $\quad$ 0.909

.....

(1)

---

35. Roy is saving money.

In January, he saves £28.65
In February, he saves £14.82
In March, he saves £22.77
Work out how much money Roy has saved in total.

£.....

(2)

36. Write 50 as a product of its prime factors.

.....

(2)

---

37. Find the Lowest Common Multiple (LCM) of 32 and 50.

.....

(2)

---

38. Mr Holland has 2500kg of rice.

(a) Write 2500 kg in grams.
Give your answer in standard form.

.....g

(2)

(b) One grain of rice weighs 0.03g
Write the weight of one grain of rice in standard form.

.....g

(1)

(c) How many grains of rice are there in 2500kg of rice?
Give your answer in standard form.

.....

(2)

39. 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)

---

40. Work out

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

Give your answer as a mixed number.

.....
(3)

---

41. Work out

$$\frac{5}{13} \div \frac{2}{3}$$

.....
(1)

42. Complete the table.

Fraction	Decimal	Percentage
		85%
	0.12	
$\frac{23}{25}$		

(4)

---

43. Sarah bought a TV for £250
Three years later she sold it for £180

Work out the percentage loss

.....%

(3)

---

44. 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)

45. Fiona leaves £1600 in the bank for four years.
It earns compound interest of 4% each year.

Calculate the total amount Fiona has in the bank at the end of the four years.

£.....

(3)

---

46. Lauren is given a 12% pay rise.
Her new salary is £24,080

What was Lauren's salary before the pay rise?

£.....

(3)

---

47. Sophie went to Spain.
She changed £225 into euros (€).

The exchange rate was £1 = €1.62

(a) Change £225 into euros (€).

€.....

(2)

On her return to England, Sophie changed €66 into pounds (£)

The new exchange rate was £1 = €1.50

(b) Change €66 into pounds (£).

£.....

(2)

48. Thomas has a recipe for making Rice Krispie cakes.
The recipe uses 120g of chocolate and 80g of Rice Krispies to make 12 cakes.

(a) How much chocolate should Thomas use to make 30 cakes?

.....g
(2)

(b) What is 120g out of 200g expressed as a percentage?

.....%
(1)

---

49. (a) Work out the difference between –3°C and 4°C

.....°C
(1)

At 5am the temperature is –6°C
By 2pm the temperature went up by 9°C
From 2pm to 11pm the temperature went down by 15°C

(b) Work out the temperature at 11pm

.....°C
(2)

50. Florence buys a car for £17100

She pays a deposit of £6750 and pays the rest in equal monthly payments.
Each monthly payment is £230

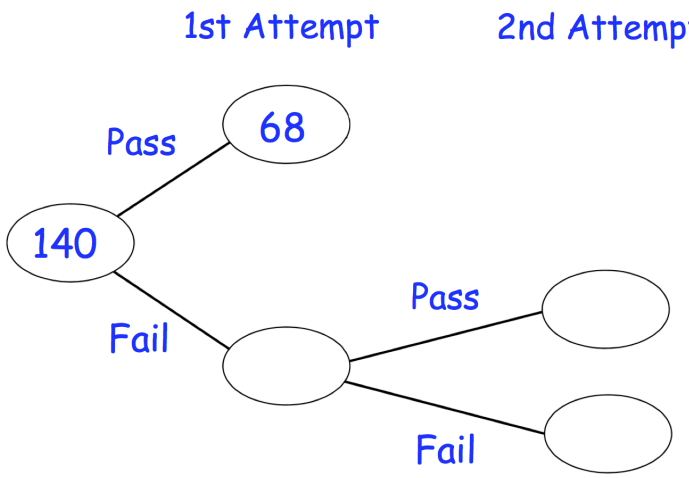
How many monthly payments does Florence make?

.....

(3)

---

51. 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)

52. 100 students study one language at a college.

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

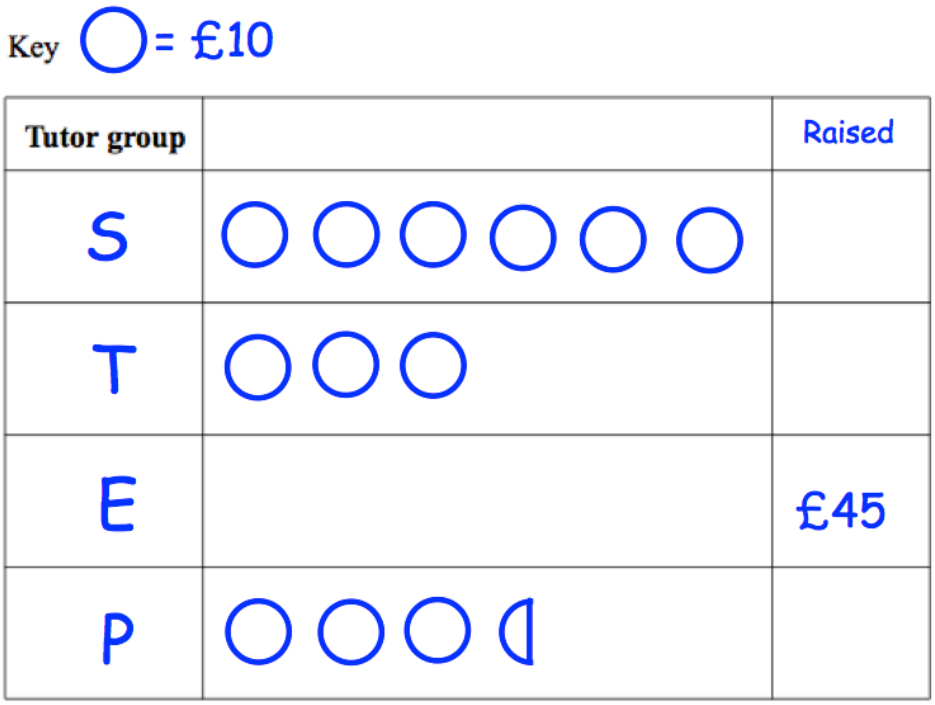
54 of the students are in Year 12.
20 of the 29 students who study Spanish are in Year 13.
31 students study German.
15 Year 13 students study French.

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

.....

(4)

53. The pictogram shows the amount of money raised by students in some tutor groups at a school.



(a) Complete the raised column.

(2)

(b) Complete the pictogram for tutor group E.

(2)

(c) How much money was raised altogether?

£.....

(1)

54. A rugby team can win, draw or lose a match.
The table shows the probabilities of each result.

Result	Win	Draw	Lose
Probability	0.4	0.35	

(a) Calculate the missing probability in the table.

.....

(2)

Each win is worth 2 points.
Each draw is worth 1 point.
Each loss is worth 0 points.
The rugby team plays 20 games in a season.

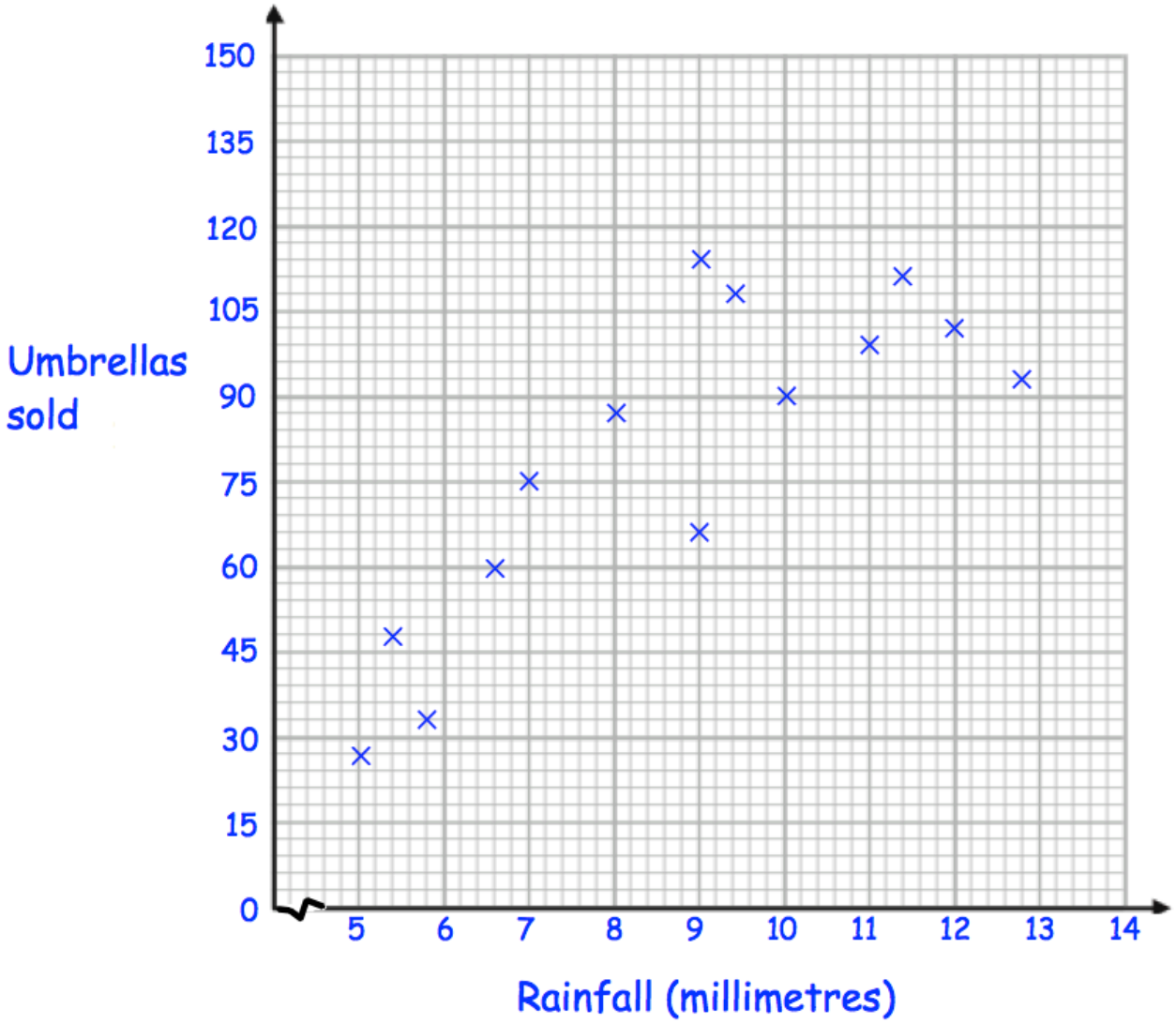
(b) Work out how many points the rugby team should receive in one season.

.....

(3)

55. A shop sells umbrellas.

The scatter graph shows information about the number of umbrellas sold each week and the rainfall that week, in millimetres.



(a) Describe the relationship between the rainfall and umbrellas sold.

.....

.....

(1)

(b) What is the greatest amount of rainfall in one week?

.....

(1)

In another week, there was 6mm of rain.

(c) Estimate the number of umbrellas sold.

.....

(2)

(d) Explain why it may **not** be appropriate to use your line of best fit to estimate the number of umbrellas sold in a week with 25mm of rainfall.

.....

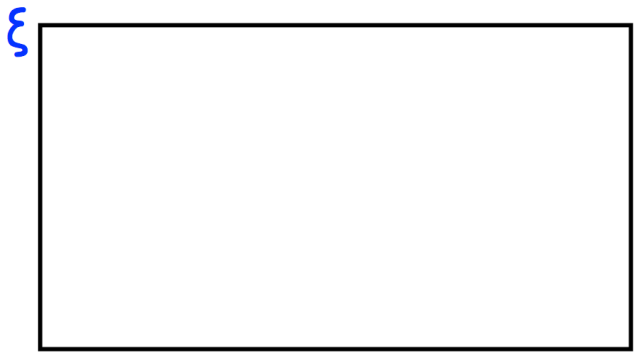
.....

(1)

56. A gym runs two fitness classes, spinning and circuits.

On Saturday 100 people visited the gym.
18 people attended the spinning class.
10 people attended both classes.
56 people did not attend either class.

(a) Represent this information on a Venn diagram



(3)

A person who attended the gym is selected at random.

Find the probability that this person

(b) attended only circuits

.....

(2)

(c) attended exactly one class

.....

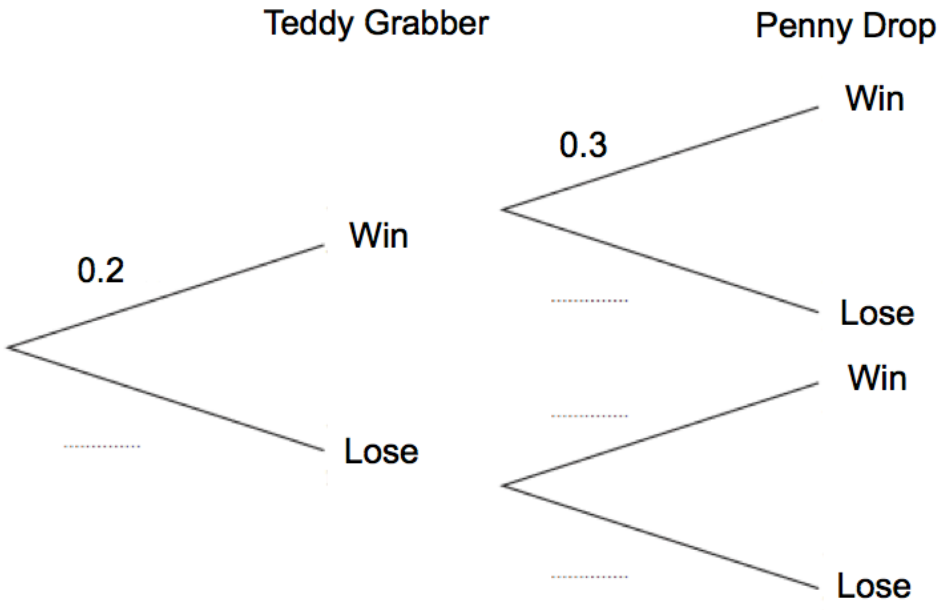
(2)

57. James goes to an arcade.

He has one go on the Teddy Grabber.
He has one go on the Penny Drop.

The probability that he wins on the Teddy Grabber is 0.2.
The probability that he wins on the Penny Drop is 0.3.

(a) Complete the tree diagram.



(2)

(b) Work out the probability that James wins on the Teddy Grabber and he also wins on the Penny Drop.

.....

(2)

58.

Name	Price (£)	Mass (kg)	Thickness (cm)	Battery (minutes)
Epic	£799	1.23	1.89	690
Bell	£1249	1.2	1.52	650
Lemon	£1599	1.37	1.49	720
HB	£799	1.28	1.7	740
Lazer	£1049	1.35	1.66	660

(a) Which laptop is the thickest?

.....

(1)

(b) How much longer does the HB battery last than the Bell battery?

.....

(1)

---

59. Simplify 9h + 5k + 4h – 8k

.....

(2)

---

60. (a) Simplify

$$m^9 \times m^2$$

.....

(1)

(b) Simplify

$$\frac{m^{10}}{m^2}$$

.....

(1)

(c) Simplify

$$(m^3)^6$$

.....

(1)

61. Expand and simplify (w – 3)(w – 8)

.....

(2)

---

62. Factorise

15y + 20

.....

(2)

---

63. (a) Factorise $x^2 + 2x - 24$

.....

(2)

(b) Factorise $x^2 - 25$

.....

(1)

---

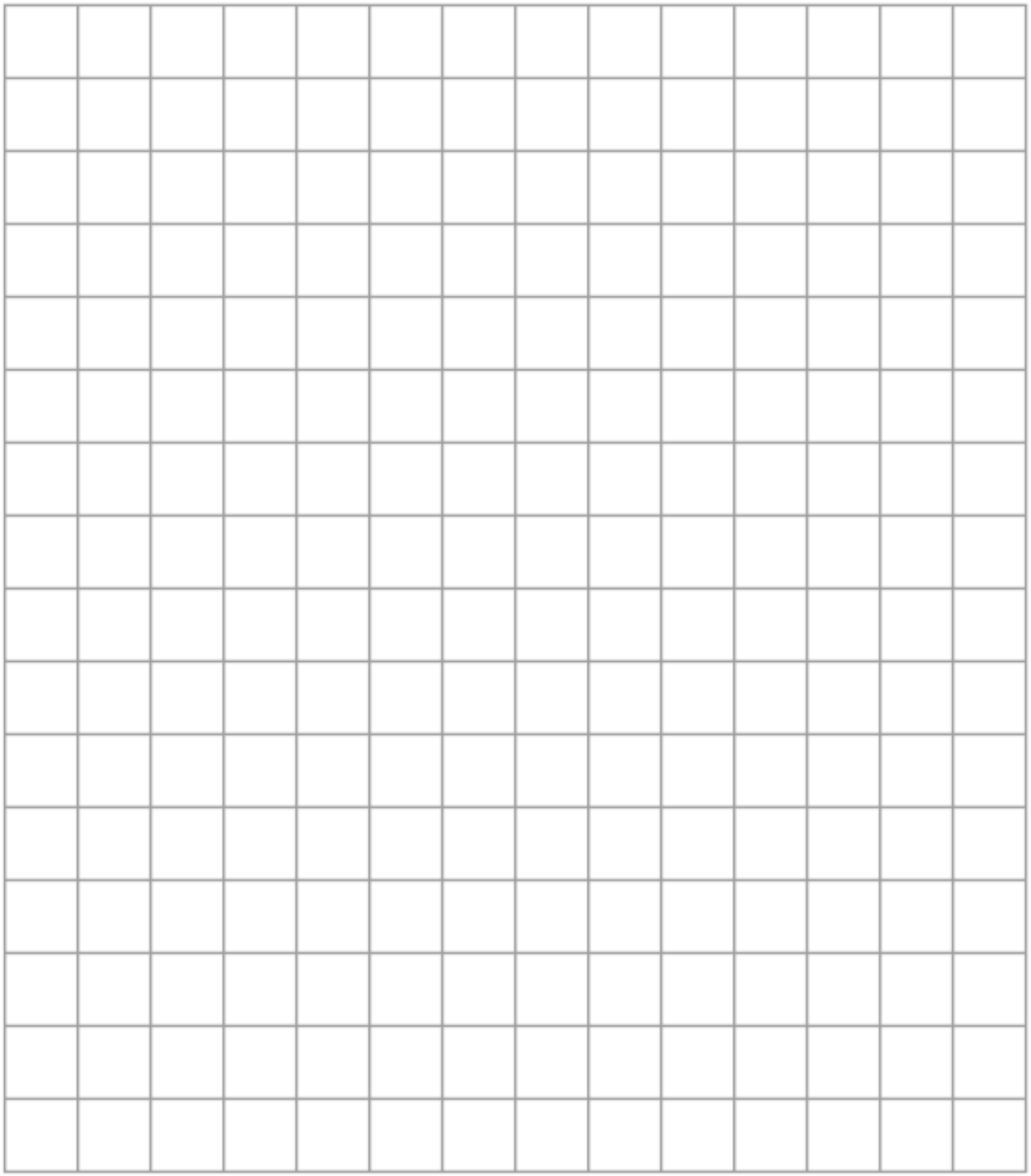
64. Solve 4y + 1 = 6y + 26

y = ...

(2)

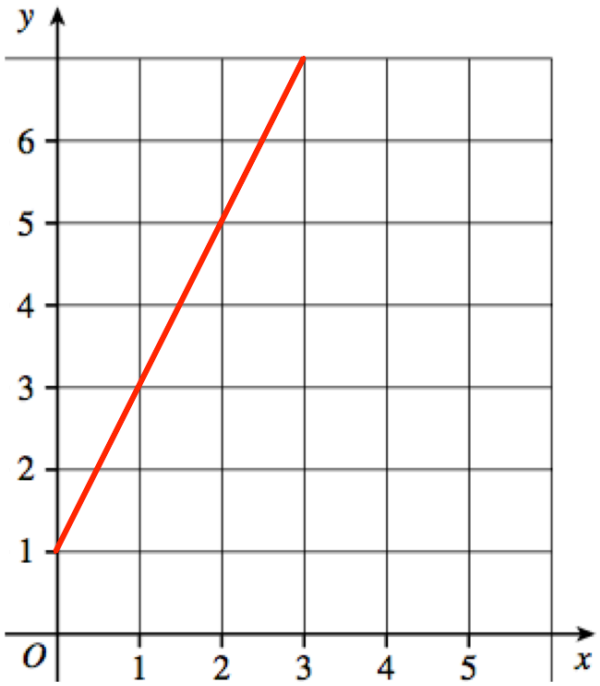
65.

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



(4)

66. A straight line L is shown on the grid.



Work out the equation of line L

.....

(3)

---

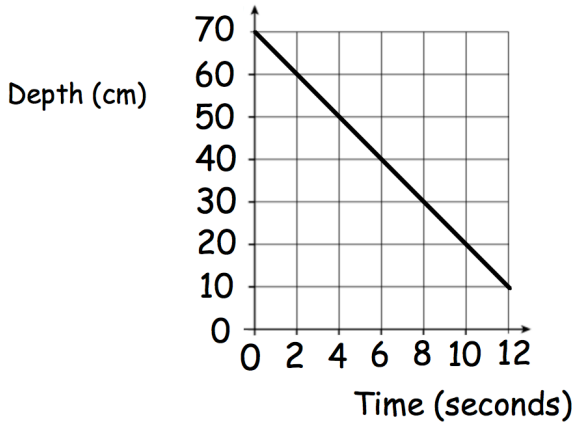
67. A is the point with coordinates (1, 4).
B is the point with coordinates (7, 22).

Find the gradient of AB.

.....

(2)

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



(a) Write down the gradient of the line

.....

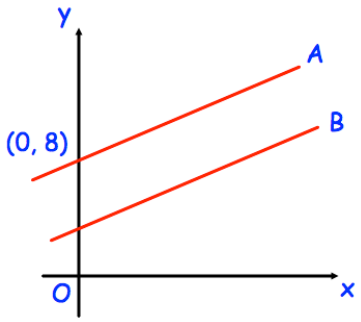
(1)

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

.....

(1)

69.



The lines A and B are parallel.

The line A passes through the point (0, 8)
The line B has equation y = 3x + 4

Write down the equation of line A

.....

(2)

---

70. Make *w* the subject of the formula

$$y = 3w - a$$

w = ...

(2)

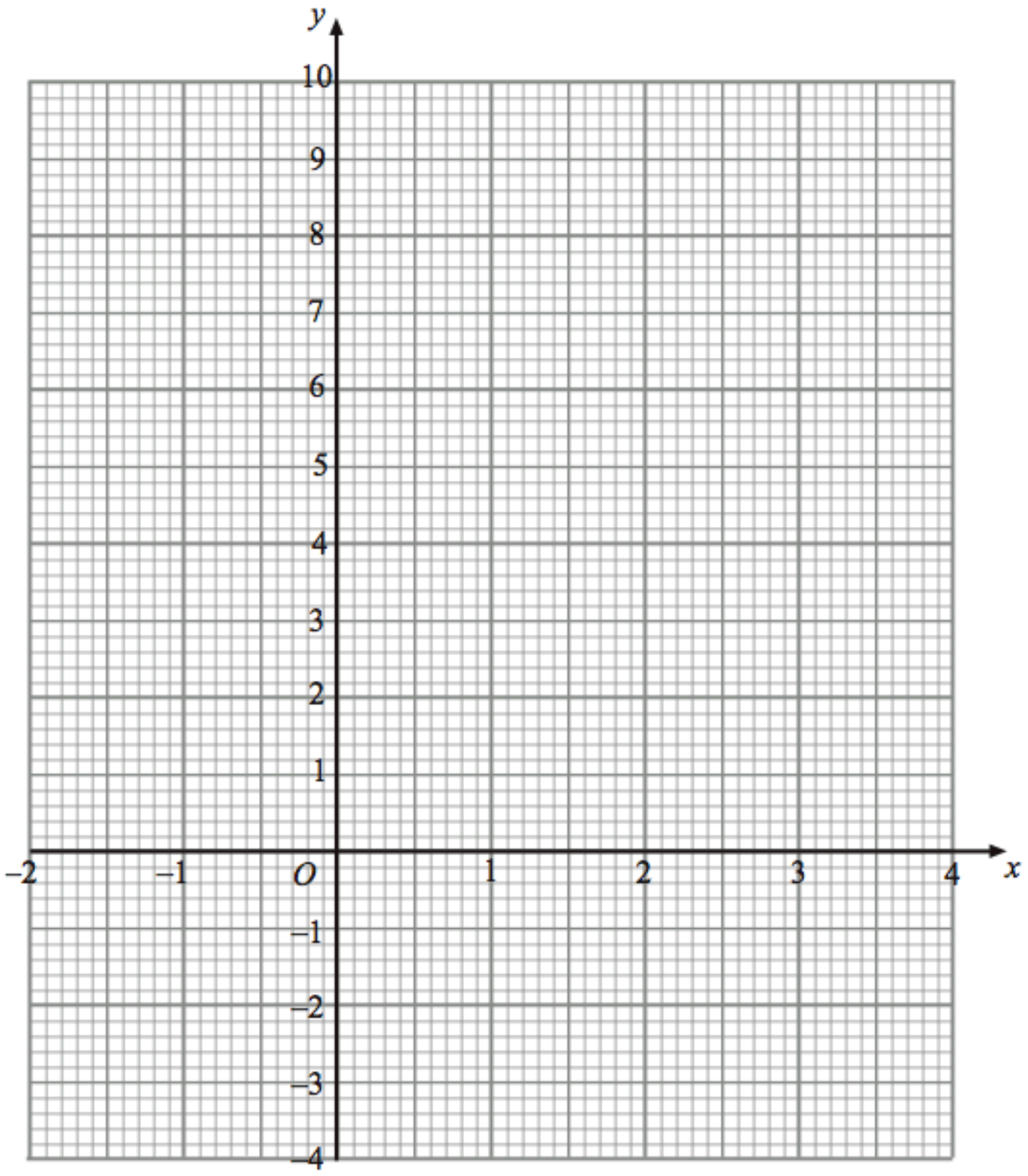
71.

(a) Complete the table of values for $y = x^2 - 3x$

x	–2	–1	0	1	2	3	4
y	10		0	-2		0	

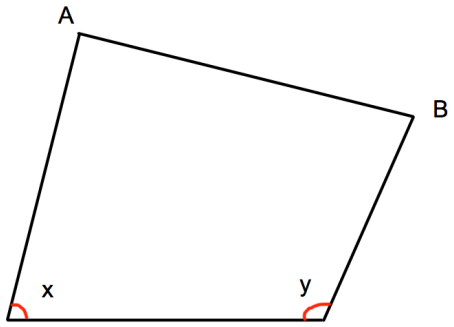
(2)

(b) On the grid, draw the graph of $y = x^2 - 3x$ for the values of x from -2 to 4.



(2)

72.

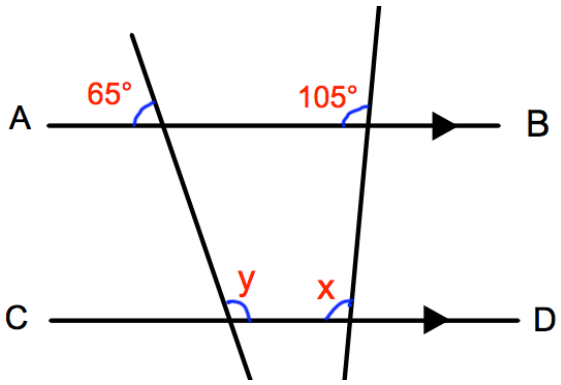


What type of angle is x?

.....

(1)

73.



AB is parallel to CD.

(a) Work out the size of the angle marked x.

.....°

Give a reason for your answer.

.....

.....

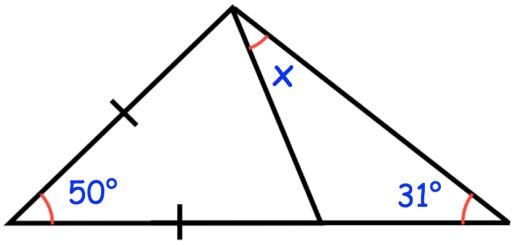
(2)

(b) Work out the size of the angle marked y.

.....°

(2)

74.

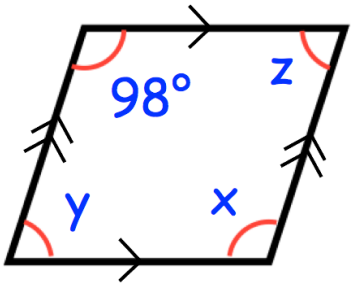


Find the size of the angle marked x.

.....°

(3)

75.



(a) Find x

.....°

(1)

(b) Find y

.....°

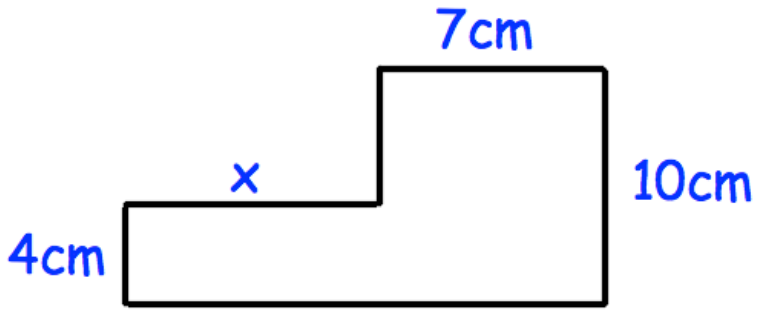
(1)

(c) Find z

.....°

(1)

76.



The area of the compound shape is 106cm².
Work out the size of x.

.....cm
(3)

---

77. The mass of a 2p coin is 7g.

Find the mass of £6 worth of 2p coins.
Give your answer in kilograms.

.....kilograms
(4)

---

78. A glass contains water.

Below are four estimates of the amount of water in the glass.
Circle the most appropriate estimate.

25ml 25L 250ml 2.5L

(1)

79. The distance chart below shows the distance, in miles, between some towns and cities.

Cambridge			
54	Ipswich		
64	45	Norwich	
43	82	78	Peterborough

(a) Write down the distance between Ipswich and Peterborough.

..... miles
(1)

(b) Write down the distance between Norwich and Cambridge.

..... miles
(1)

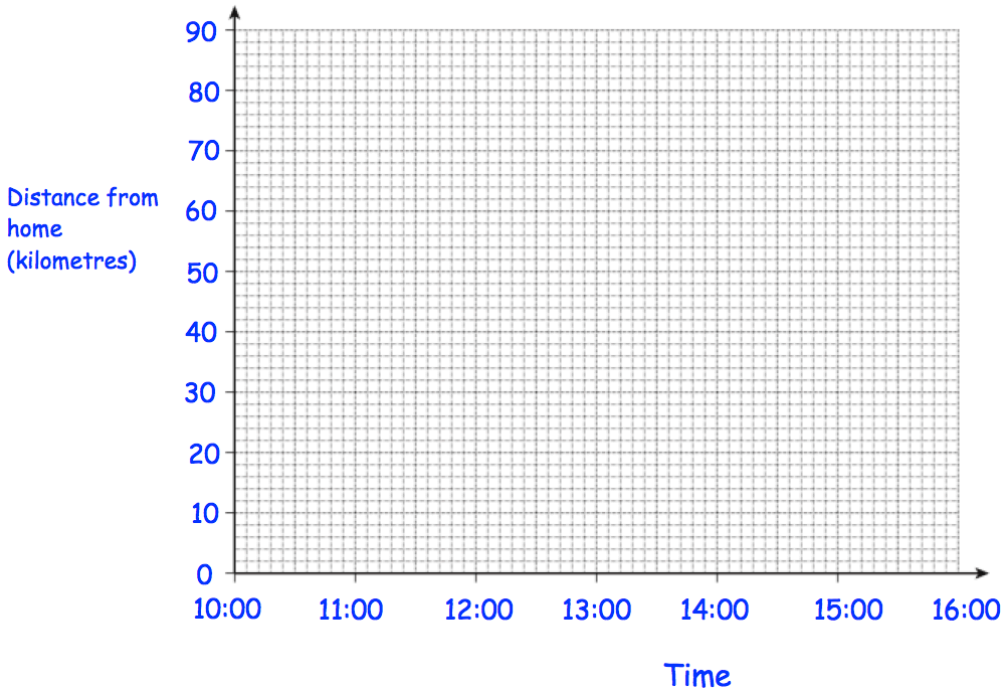
(c) Write down the names of the places that are 78 miles apart

..... and.. .....
(1)

80. 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)

---

81. Iron has a density of 7.8g/cm³.
A solid iron statue has a mass of 877.5g.
Work out the volume of the statue.

……..cm³

(2)

82.

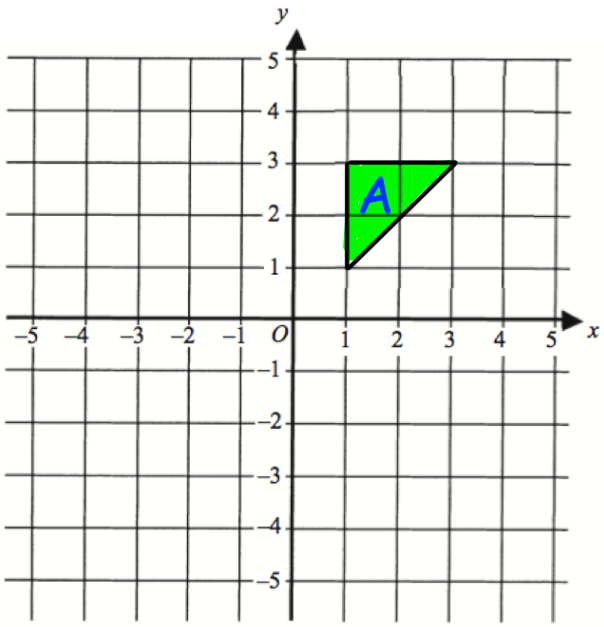
An object is placed on a table.
It exerts a force of 22 newtons on the table.

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)

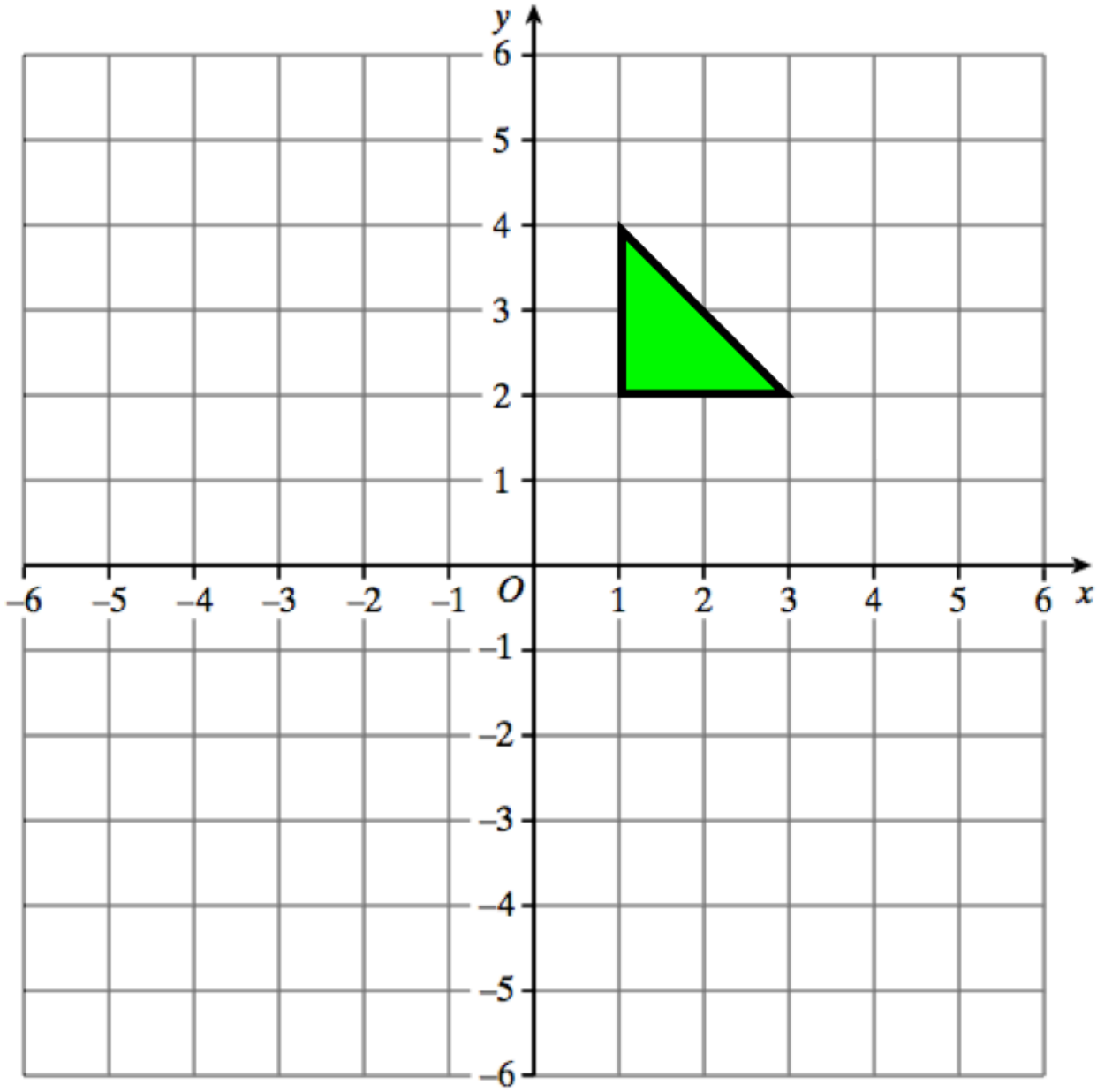
83.



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

(2)

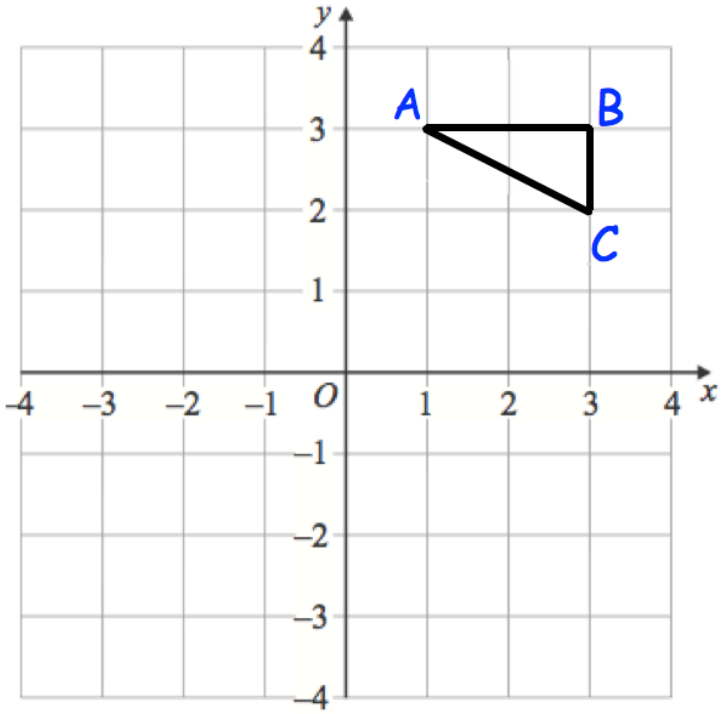
84.



Reflect the triangle in the line y = –1
Label the new triangle B.

(2)

85.



Rotate triangle ABC 90° clockwise about centre (0, 0)

(3)

---

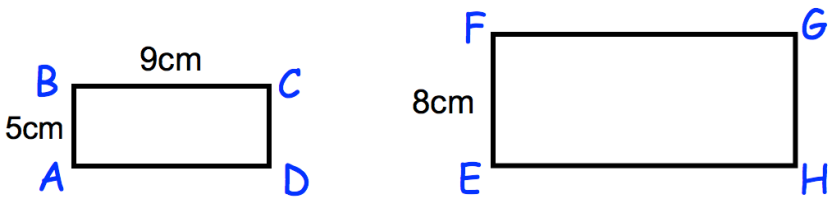
86. Write down the exact value of Sin 30°

.....

(1)

87.

Not drawn accurately



Rectangles *ABCD* and *EFGH* are similar.

AB = 5cm
BC = 9cm
EF = 8cm

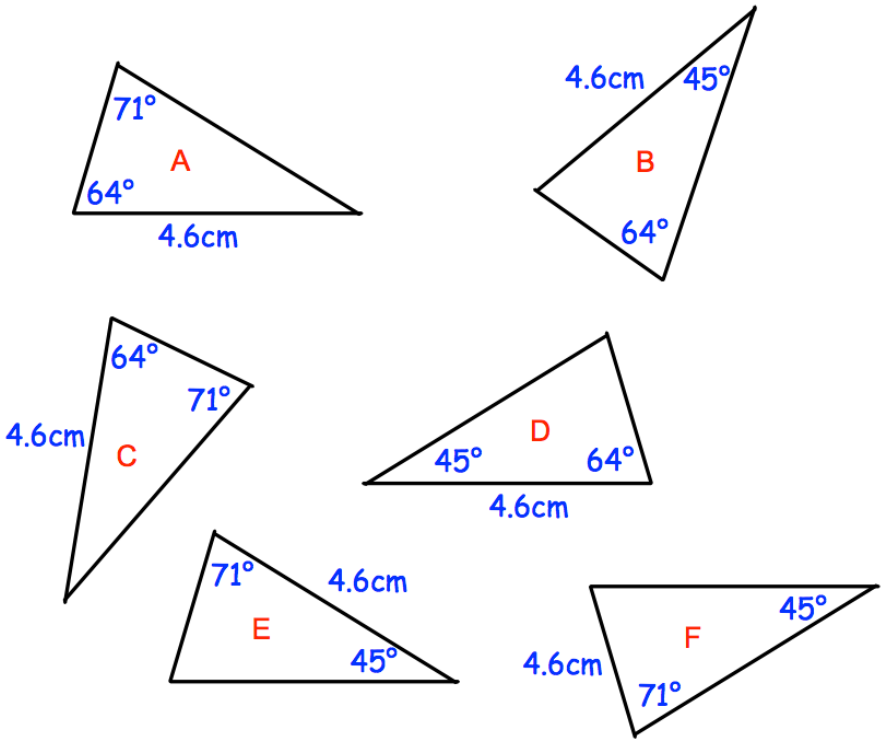
Work out the length of FG.

.....cm

(2)

---

88. Shown below are six triangles that are not drawn accurately.



Which two triangles are congruent to triangle A?

..... and .....

(2)

89. Write down all the factors of 36.

.....

(2)

---

90. Write down all the prime numbers between 10 and 20.

.....

(2)

---

91. Megan says “when you square root a number, the answer is always smaller.”

Show she is wrong.

(2)

---

92. From the list of numbers

3 6 8 14 16 28 41 64

(a) write down the cube numbers

..... and .....

(2)

(b) write down the cube root of 27.

.....

(1)

93. Calculate 3^6

.....

(1)

---

94. Work out

$$10^{-2}$$

Give your answer as a decimal.

.....

(2)

---

95. The attendance at Frome United versus Trowbridge Rovers was 8,701.

Of this crowd, five-sevenths supported Frome United.
Calculate how many people did not support Frome United.

.....

(3)

---

96. Write down the reciprocal of 0.35

.....

(1)

97. Express 42 as a percentage of 64

.....%

(2)

---

98. Joanne sees this special offer in a shop.

Special Offer

Laptop	£465
Printer	£109

Buy both items and receive a 10% discount

Joanne buys both items.

How much does she pay?

£.....

(3)

99. Chris and Molly win money in a competition.
They share the money in the ratio 2 : 3
Molly receives £240.

(a) How much money does Chris receive?

£.....
(2)

(b) How much money did they win in the competition?

£.....
(1)

---

100. Here are four digits.

9 4 7 5

(a) Use two of these digits to make the largest possible two-digit number.

.....
(1)

(b) Use all four of these digits to make the four-digit number closest to 5000.

.....
(1)

---

101. A number, n, is rounded to 1 decimal place.
The result is 1.3

Using inequalities, write down the error interval for n.

.....
(2)

102. The number of months, m, to complete a piece of research is found by $m = \frac{600}{n}$

where n is the number of scientists working on the research.

How long should the research take if 12 scientists are working on it?

.....

(2)

---

103. Sophie asks 20 of her friends to choose their favourite sport.

Their replies are

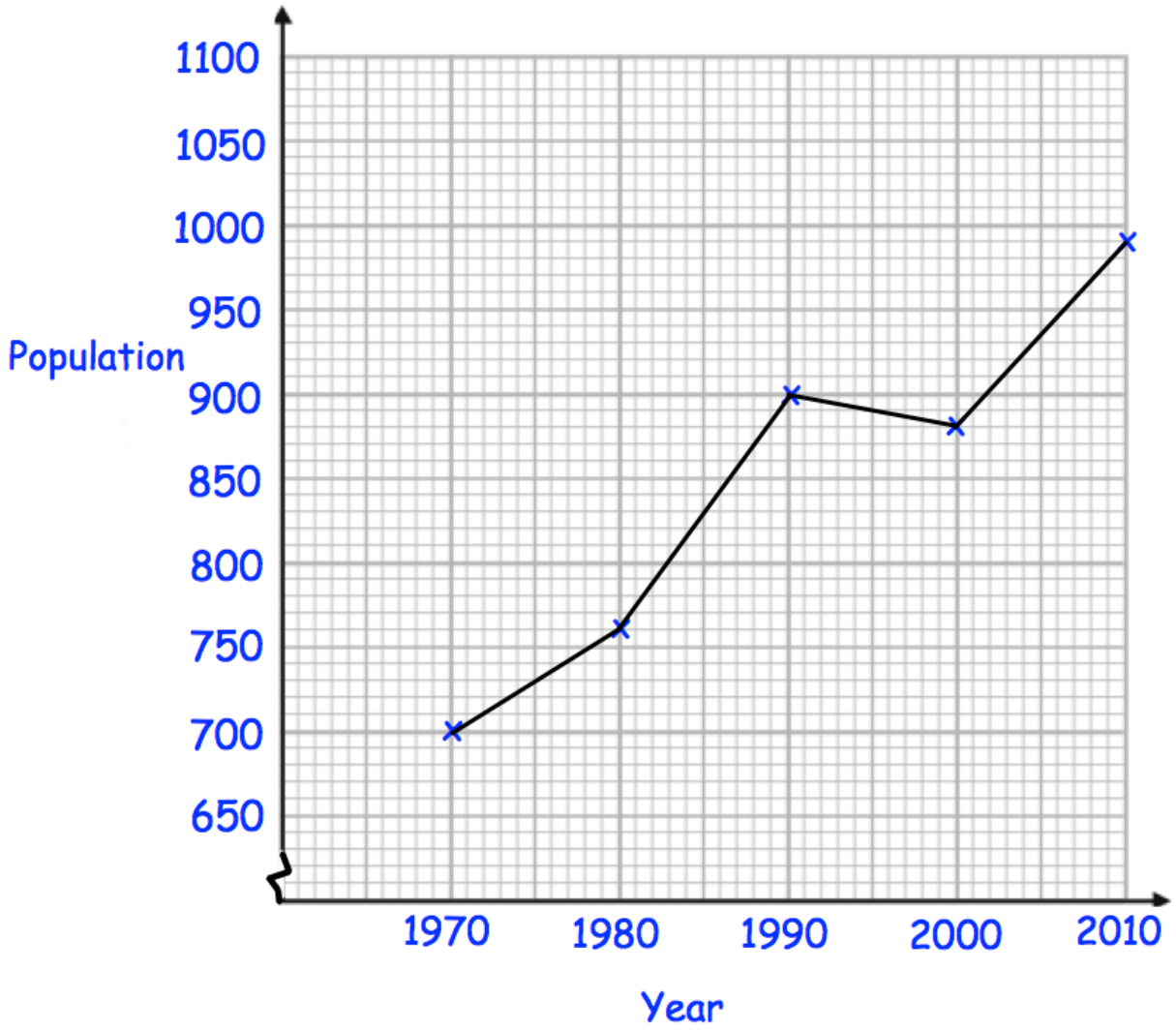
Rugby	Football	Rugby	Hockey	Cricket
Football	Football	Rugby	Hockey	Football
Rugby	Cricket	Hockey	Football	Football
Football	Rugby	Football	Football	Rugby

Complete the tally and the frequency columns in the table below.

Sport	Tally	Frequency
Rugby		
Football		
Hockey		
Cricket		

(2)

104. Below is a line graph that shows the population of a village.



(a) What was the population in 1980?

.....

(1)

(b) In which year was the population 700?

.....

(1)

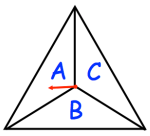
The population increased by 120 by 2020.

(c) Work out the population in 2020.

.....

(2)

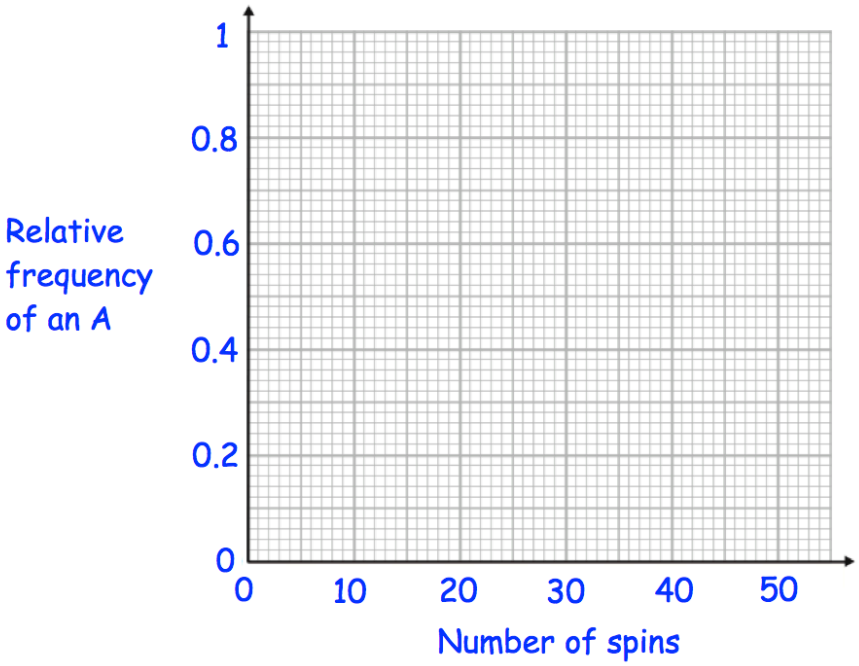
105. A three-sided spinner is labelled A, B and C.



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)

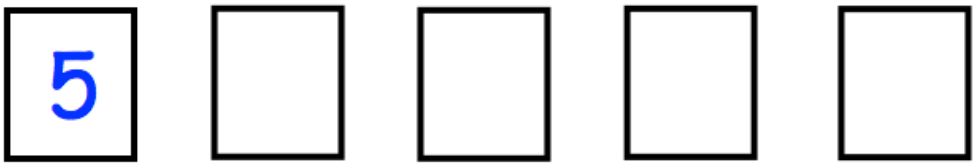
(b) Neil says the relative frequency after 50 spins is 0.8
Explain why Neil must be wrong

.....

.....

(2)

106. Shown below are five cards which are arranged in order from smallest to largest



The range of the cards is 4.
The median of the cards is 8.
The mean of the cards is 7.

Work out the 4 missing numbers.

....., ..., ... and .....

---

107. 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)

108. 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)

---

109. 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)

110. 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)

---

111. 480 students attend a school.
A teacher asks 50 students which colour they would like the new school blazer to be.

The table shows the results.

Colour	Number of students
Black	20
Navy	15
Green	9
Maroon	6

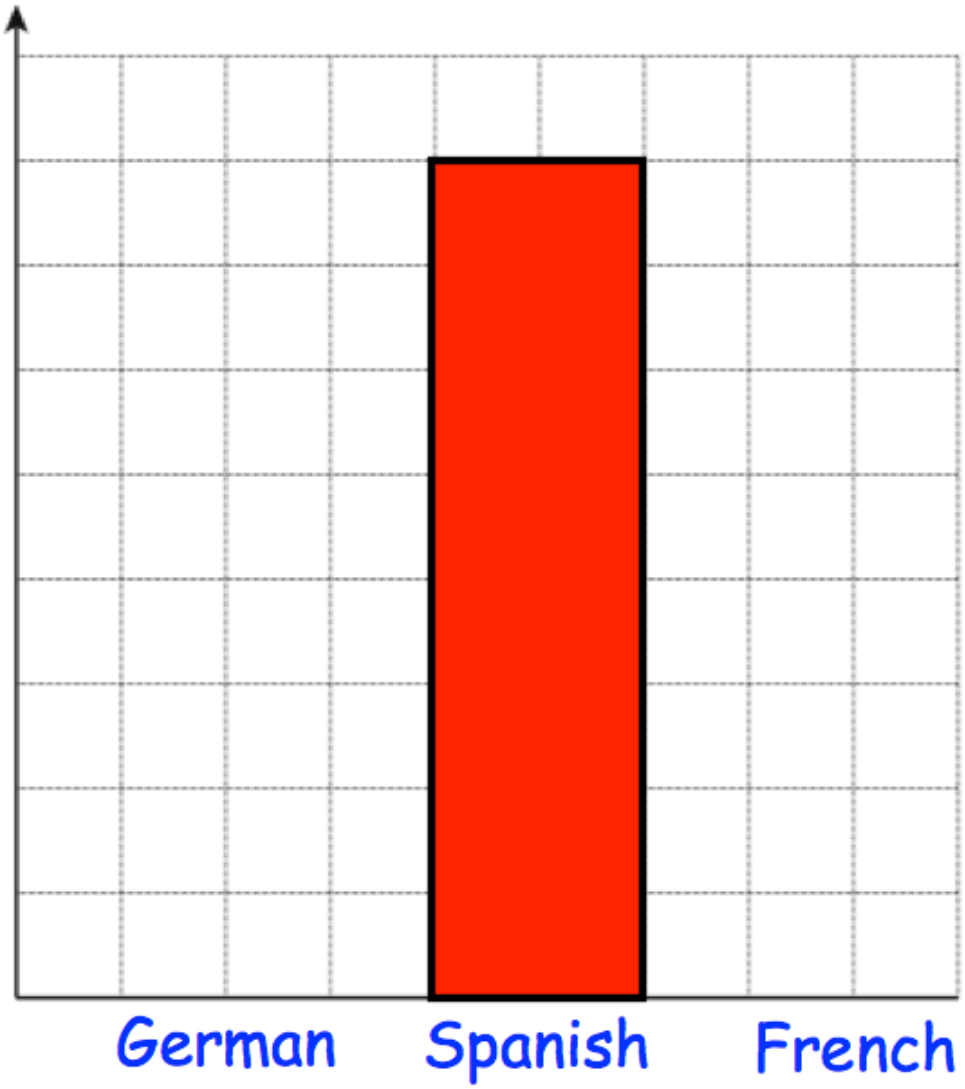
Estimate how many of the 480 students would like a black blazer.

.....

(2)

112. Miss Jackson asked the 32 students in her tutor group which language they study.

Each student studies one language only.

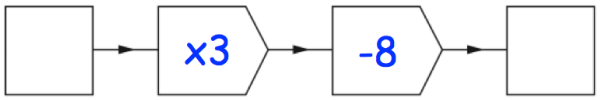


Half of the students in the tutor group study Spanish.
Six more students study German than French.

Complete the bar chart.

(4)

113.



(a) Work out the output, when the input is 10.

.....

(1)

(b) Work out the input, when the output is 13.

.....

(1)

(c) If the input is the same as the output, work out the input.

.....

(1)

---

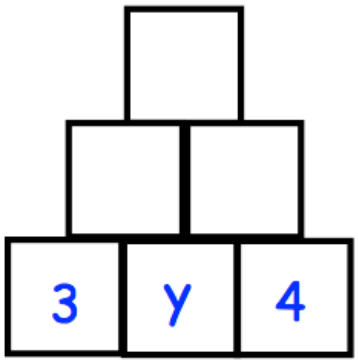
114. An airplane has economy and first class seating.
There are *s* seats in each row in economy.
There are *t* seats in each row in first class.
There are 8 rows in first class and 18 rows in economy.

Write down an expression, in terms of *s* and *t*, for the number of seats on the airplane.

.....

(2)

115.



To find the contents of each empty box, multiply the two terms directly beneath it.

Complete the multiplication pyramid.

(3)

---

116. Circle the geometric progression.

11, 9, 7, 5 ... 1, 4, 9, 16 ... 11, 21, 31, 41 ... 1, 4, 16, 64 ...

(1)

---

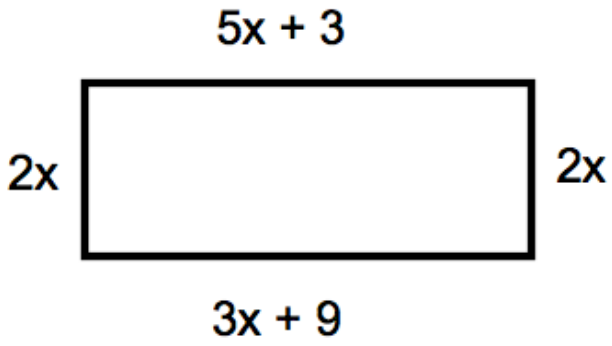
117. Work out the *n*th term for this sequence

8 17 26 35 44 ... ...

.....

(2)

118.



The diagram shows a rectangle. The sides are measured in centimetres.

(a) Explain why $5x + 3 = 3x + 9$

.....

.....

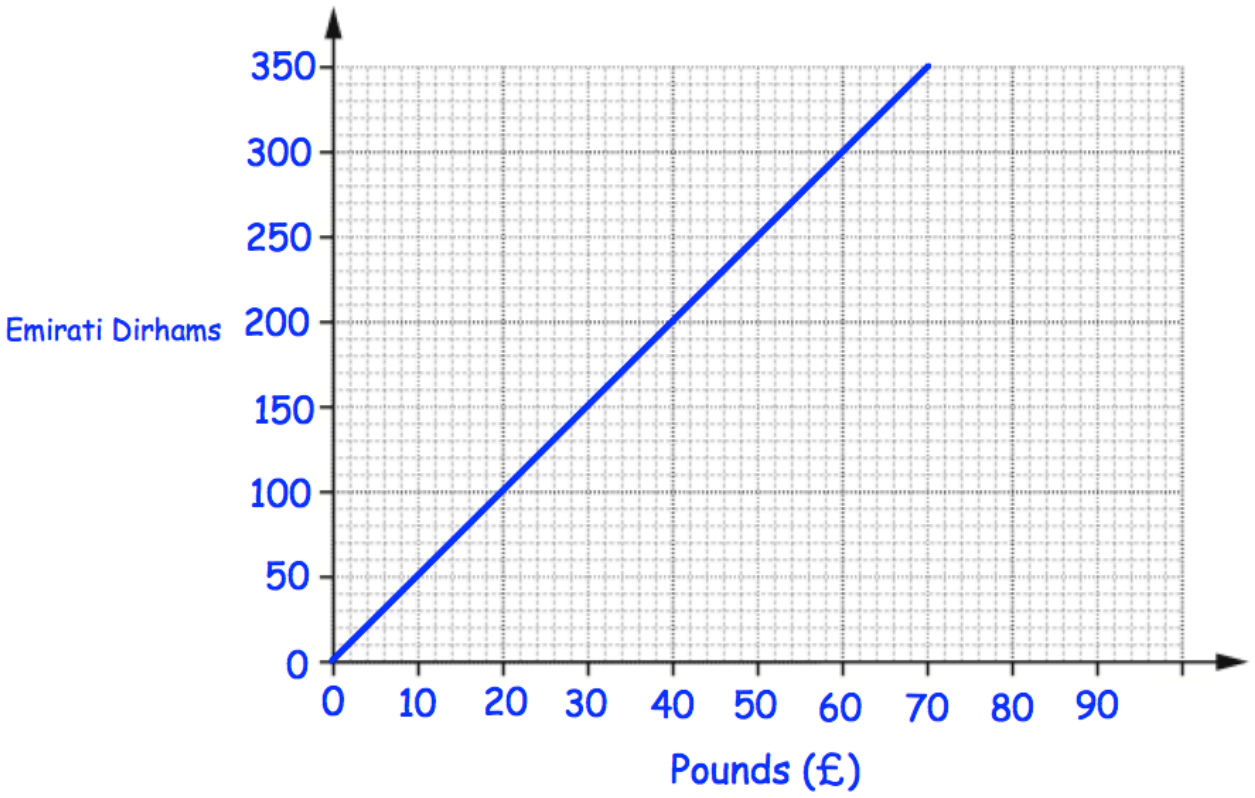
(1)

(b) Solve $5x + 3 = 3x + 9$

x =.....cm

(2)

119.



(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)

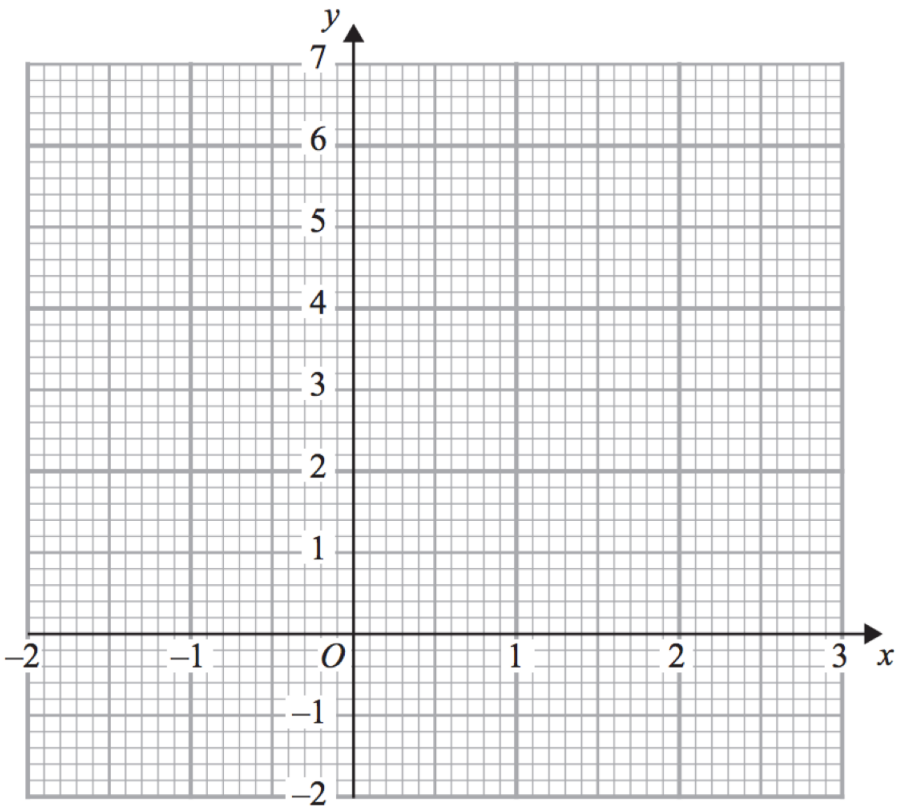
120.

(a) Complete the table of values for $y = x^3 - 2x + 3$

x	-2	-1	0	1	2
y					

(2)

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



(2)

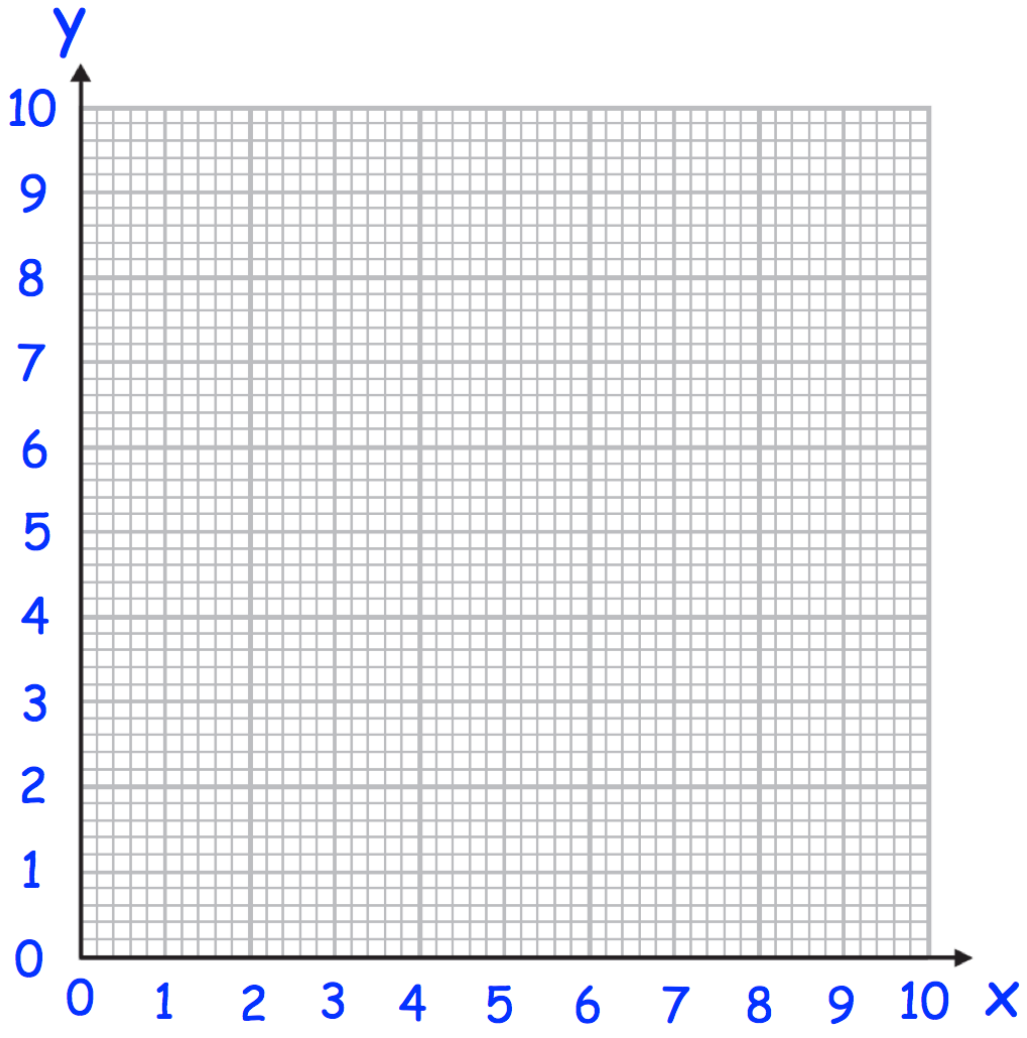
121.

(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)