Paper 3 Preparation Paper

Edexcel Foundation

Corbettmaths

The topics highlighted in green (and bold) are the starred topics from the Paper 3 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

Revision for this test

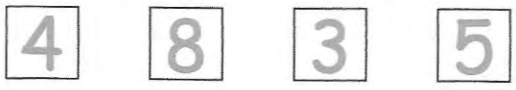
Question	Topic	Video number
1	Place Value	222
2	Ordering Decimals	95
3	Negative Numbers	205 to 209
4	Factors	216
5	**Function Machines**	**386**
6	**Cube Numbers and Cube Roots**	**212, 214**
7	**LCM, HCF**	**218, 219**
8	Fractions, Decimals, Percentages	121 to 129
9	Recipes	256
10	Coordinates	84
11	Writing Expressions	16
12	**Angles in a Triangle**	**37**
13	**Angles in a Quadrilateral**	**33**
14	**Bar Charts**	**147, 148**
15	**Symmetry**	**316, 317**
16	**Faces, Edges, Vertices**	**5, 3**
17	Timetables	320
18	Distance Charts	318
19	Line Graphs	160
20	**Translations**	**325, 326**
21	Parts of the Circle	61
22	Nets	4
23	Multiplying Terms	18
24	**Two-way Tables**	**319**
25	Frequency Polygons	155, 156
26	**Listing Outcomes**	**253**
27	Collecting Like Terms	9
28	**Mode, Median, Range, Mean**	**56, 50, 53, 57**
29	**Stem and Leaf**	**169, 170**
30	Types of Angle	38

Question	Topic	Video number
31	**Rounding**	**276, 277a, 277b, 278**
32	**Order of Operations**	**211**
33	Multiples	220
34	**Prime numbers**	**225**
35	**Square numbers and Square roots**	**226, 228**
36	Product of primes	223
37	**Fractions of Amounts**	**137**
38	**Percentages of Amounts**	**234, 235**
39	**Ratio**	**269, 270, 271**
40	**Substitution**	**20**
41	Probability	245, 246, 248
42	Scatter Graphs	165 to 168
43	**Pictograms**	**161, 162**
44	Frequency Trees	376
45	Units	347, 349
46	Area of Rectangles/Triangles	45, 49
47	**Angles in Polygons**	**32**
48	Angle Facts	35, 30, 34, 39
49	Speed, Distance, Time	299
50	Estimated Mean	55
51	Venn Diagrams	380
52	Tree Diagrams	252
53	**Currency**	**214a**
54	**Drawing Linear Graphs**	**186**
55	Reverse Percentages	240
56	**Ratio**	**269, 270, 271**
57	**Percentage Change**	**233**
58	Negative Indices	175
59	**Expanding Two Brackets**	**14**
60	**Equations (letters both sides)**	**113**

Question	Topic	Video number
61	nth term	288
62	Factorising	117
63	**Factorising Quadratics**	**118**
64	**y = mx + c**	**191**
65	Solving Inequalities	178
66	Conversion Graphs	151
67	**Difference between 2 Squares**	**120**
68	Compound Interest	236
69	**Standard Form (operations)**	**301, 302, 303**
70	Cubic Graphs	344
71	Reciprocal Graph	346
72	**Angles in Parallel Lines**	**25**
73	**Constructions**	**72, 78**
74	**Loci**	**75, 76, 77**
75	Surface Area	310
76	**Density**	**384**
77	Pressure	385
78	Volume of a Prism	356
79	**Enlargements**	**104, 105, 107**
80	**Circumference**	**60**
81	**Views**	**354**
82	Area of Compound Shapes	41
83	**Volume of a Cylinder**	**357**
84	**Trigonometry**	**329, 330, 331**
85	**Arc Length**	**58**
86	**Area of a Sector**	**46**
87	**Surface area of Solids**	**313, 314**
88	**Volume of Spheres/Cones**	**359, 361**
89	**Vectors (Columns)**	**353a**
90	Reflections	272, 273

Question	Topic	Video number
91	**Rotations**	**275**
92	Congruent Triangles	67
93	**Similar Shapes**	**292**
94	**Quadratic Graphs**	**264**
95	**Simultaneous Equations**	**295**
96	**Changing the Subject**	**7**
97	**Forming Equations**	**114, 115**
98	**Parallel Graphs**	**196**
99	**Pie Charts**	**163, 164**
100	Indices	172, 174
101	Exact Trig Values	341
102	**Pythagoras**	**257**
103	**Area of a Circle**	**59**
104	**Bearings**	**26, 27**
105	**Area of a Trapezium**	**48**
106	Error Intervals	377
107	Best Buys	210
108	Use of a Calculator	352
109	**Ratio - Problem Solving**	**269, 270, 271**
110	**Travel Graphs**	**171**
111	**Perimeter**	**241**
112	**Proportion**	**255a, 254**

1. Here are four digits.



Use all four digits to make the number closest to 4000.

3854

.....

(1)

2. Arrange these distances in order, from shortest to longest

6.077m 6.31m 6.19m 6.4m 6.009m

6.009m	6.077m	6.19m	6.31m	6.4m

(1)

3. Sian thinks of two different numbers

The two numbers have a total of 3
The same numbers have a difference of 5

What two numbers did Sian think of?

$-1 + 4 = 3$

-1	4

(2)

4. Write all the numbers between 12 and 50 that are factors of 90

15, 18, 30, 45

(2)

5. Here is a function machine.

The output is equal to the input.

Find the input.

$6x - 80 = x$

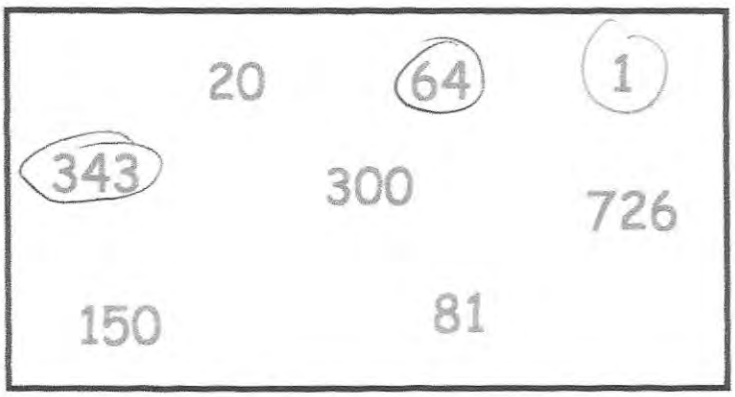
$5x = 80$

$x = 16$

16.....

(2)

6.



Circle all the cube numbers.

(2)

7. A bus heading to Belfast leaves Antrim every 25 minutes.
A bus heading to Ballymena leaves Antrim every 30 minutes

At 10am bus to Belfast and a bus to Ballymena both leave Antrim Bus Station.

Work out the next time that both buses leave at the same time.

25, 50, 75, 100, 125, (150) 150 minutes = 2·5 hours

30, 60, 90, 120, (150)

12·30pm

(3)

8. Complete the table

Fraction	Decimal	Percentage
$\frac{11}{100}$	0.11	11%
$\frac{9}{20}$	0·45	45%
17/25	0·68	68%
$\frac{3}{8}$	0·375	37·5%

(3)

9. Heather is making chocolate biscuits.
She has:

2kg of flour
1kg of butter
340g of icing sugar
200g of chocolate

Here is the list of ingredients for making 20 biscuits.

makes 20

100g flour	2000 ÷ 100 = 20
120g butter	1000 ÷ 120 = 8 3̇
80g icing sugar	340 ÷ 80 = 4.25
25g chocolate	200 ÷ 25 = 8

Heather wants to make as many biscuits as she can.

Work out how many biscuits Heather can make.

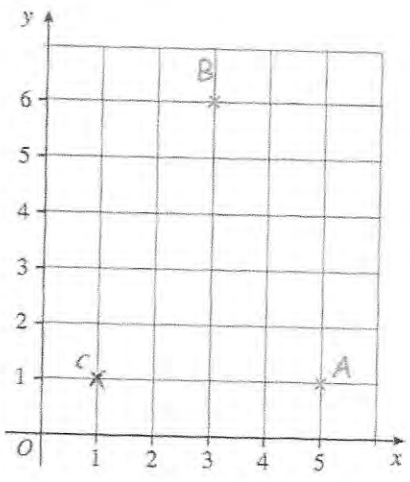
20 × 4.25

85

.....

(3)

10. ABC is an isosceles triangle



Write down the coordinates of point C

(1, 1)

.....

(3)

11. In one week, Gina spent x minutes on the internet.
Sammy spent 15 minutes less than Gina.

(a) Write down an expression for how long Sammy spent on the internet.

$x-15$

(1)

Neil spent three times as long as Gina on the internet.

(b) Write down an expression for how long Neil spent on the internet.

$3x$

(1)

(c) Write down an expression for total time spent on the internet.

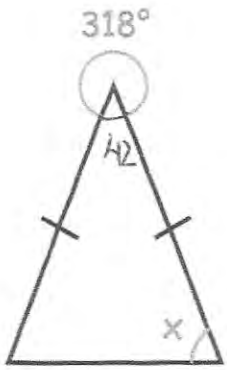
$3x + x + x - 15$

$5x - 15$

$5x-15$

(1)

12.



$180 - 42 = 138$

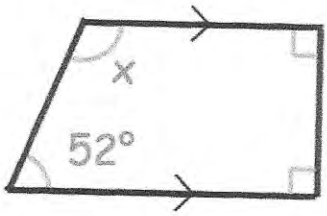
$138 \div 2 = 69$

Find the size of angle x

$69°$

(3)

13.



Find the size of angle x

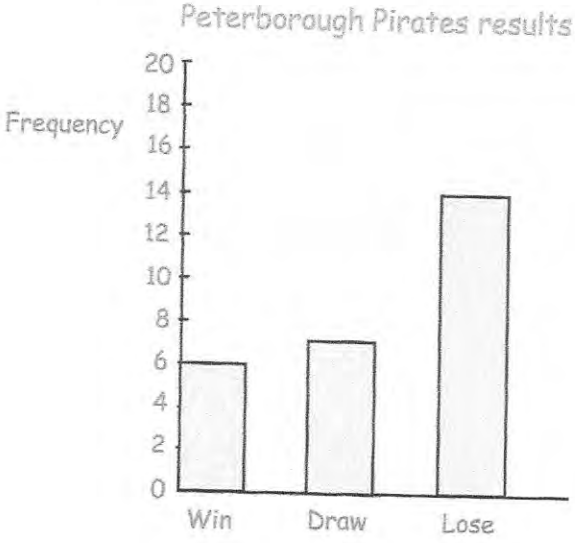
$90 + 90 + 52 = 232$

$360 - 232 = 128°$

128°

(2)

14. Peterborough Pirates are an ice hockey team.
They play in a league where a win earns 5 points, a draw earns 2 point and a loss earns –1 points.



Belfast Giants:	50 points (3)
Cardiff Devils:	23 points (9)
Coventry Blaze:	49 points (4)
Edinburgh Capitals:	51 points (2)
Manchester Storm:	12 points (10)
Nottingham Panthers:	28 points (8)
Sheffield Steelers:	55 points (1)
Swindon Wildcats:	33 points (5)
Telford Tigers:	32 points (6)

The bar chart shows information about their results in 2019.
The table shows the final points for the other 9 teams in the league.

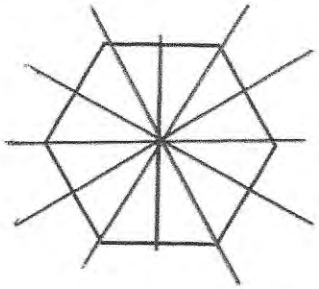
In which position did Peterborough Pirates finish?

$6 \times 5 = 30$
$7 \times 2 = 14$
$14 \times -1 = -14$
} 30 points (7)

7th

(4)

15. The diagram below shows a regular hexagon.



(a) Write down the order of rotational symmetry of the hexagon.

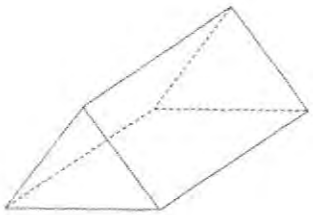
6

(1)

(b) On the diagram draw in all the lines of symmetry.

(2)

16. Below is a solid shape.



(a) What is the mathematical name for the shape?

Triangular Prism

(1)

(b) Write down the number of vertices

6

(1)

(c) Write down the number of faces

5

(1)

(d) Write down the number of edges

9

(1)

17. Here is part of a bus timetable.

Ballymena	15 12	16 12	17 12
Antrim	15 34	-----	17 34
Templepatrick	15 50	-----	17 50
Belfast	16 10	17 00	18 10

58minutes 48minutes

Evelyn wants to travel from Ballymena to Belfast.
The 16:12 in an "express bus."

How many minutes shorter is the journey if she takes the "express bus?"

10minutes

(3)

18.

Foxtown			
52	Sandcliff		
70	32	Red Island	
31	14	28	Donhampton

Martin lives in Foxtown.
He works in Donhampton.
Martin drives to work in the morning and back home in the evening.
He works Monday to Friday. 5 days

Work out how many miles Martin drives each week.

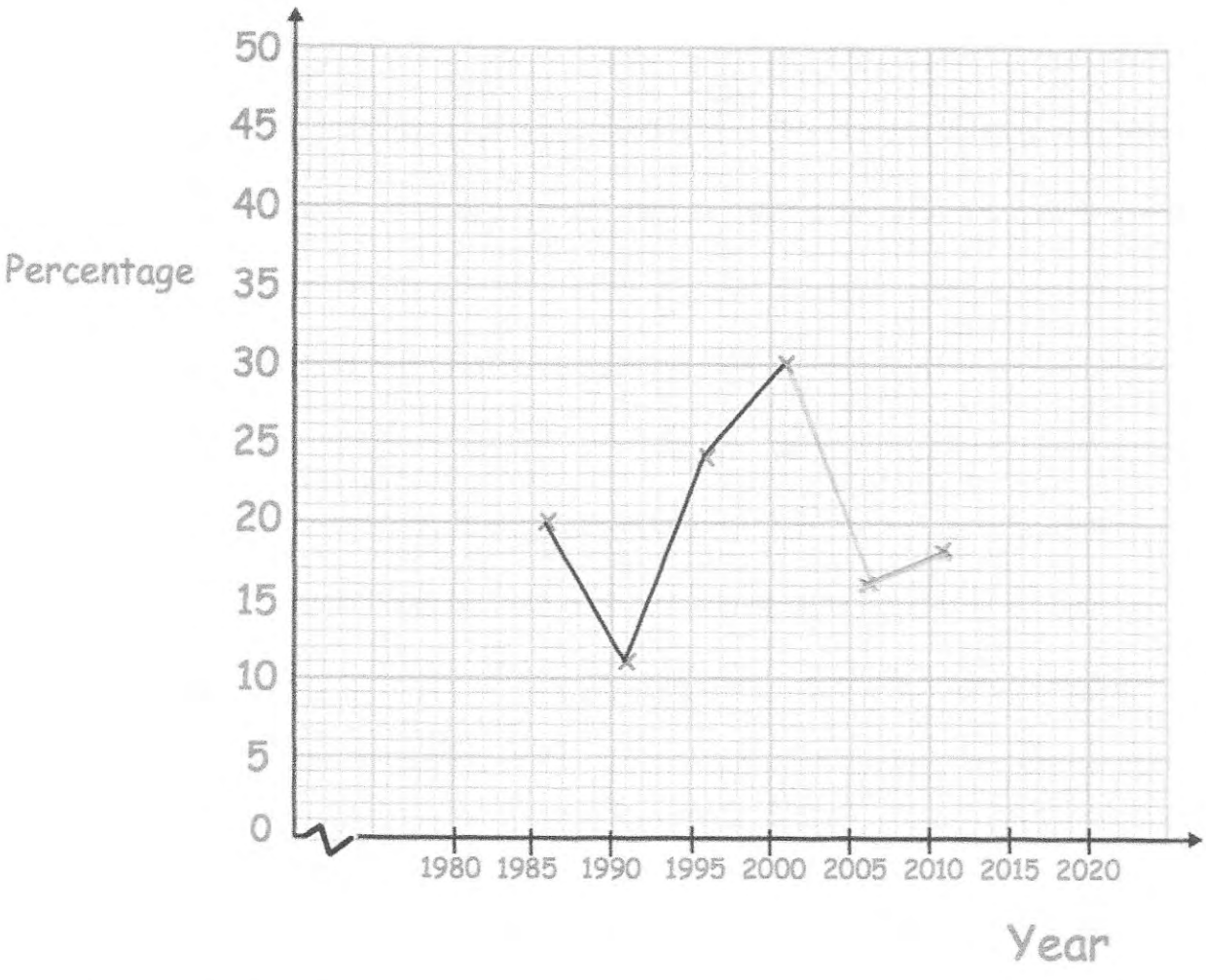
$$\begin{array}{r} 31 \\ \times\ 2 \\ \hline 62 \end{array} \qquad \begin{array}{r} 62 \\ \times\ 5 \\ \hline 310 \end{array}$$

310 miles

(3)

19. The table shows the percentage of the vote that the Purple Party received in six general elections.

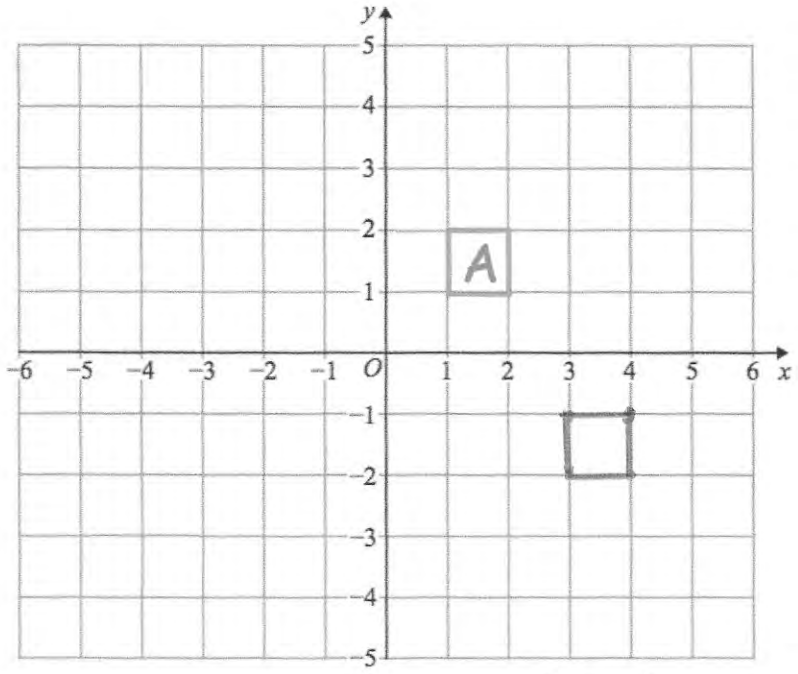
Year	Percentage
1986	20%
1991	11%
1996	24%
2001	30%
2006	16%
2011	18%



Complete the line graph.

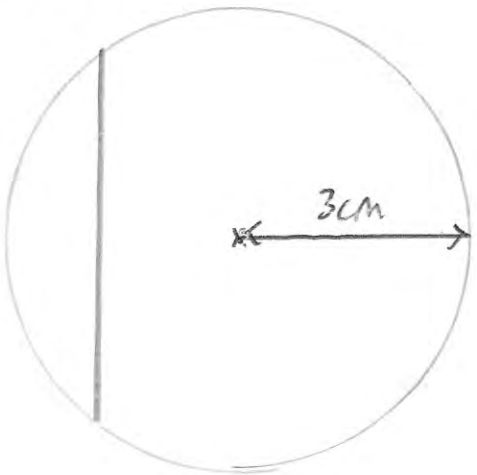
(2)

20.



(2)

21. (a) Draw a circle of radius 3cm.



(1)

(b) Write down the length of the diameter of the circle.

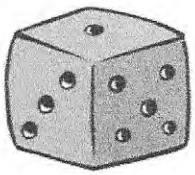
6 .....cm

(1)

(c) On your diagram draw a chord.

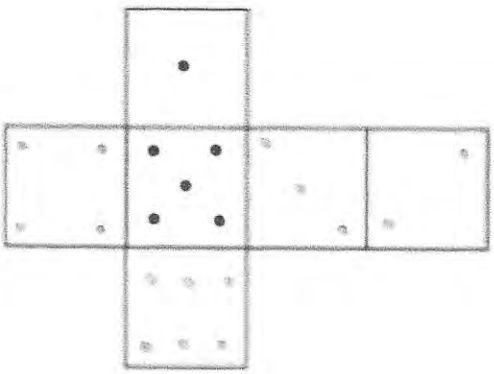
(1)

22. Shown is the view of a dice.



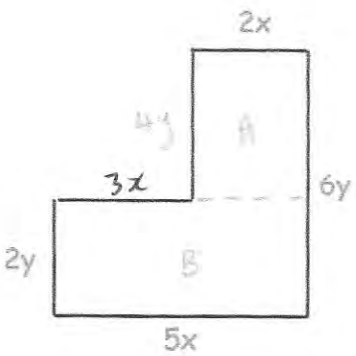
The number of dots on the opposite faces add to 7.

Fill in the missing faces.



(2)

23.



Write down an expression for the area of the shape.

Area A = 8xy

Area B = 10xy

Total = 18xy

18xy

(3)

24. There are 120 students in total in Years 10 and 11 at a school.
Each student studies one language, either French, Spanish, German or Welsh.

21 of the 40 students studying Welsh are in Year 10.
18 Year 10 students and 9 Year 11 students study French.
12 of the 17 students studying Spanish are in Year 11.
Twice as many Year 11 students study German than Year 10 students.

How many students are in Year 11?

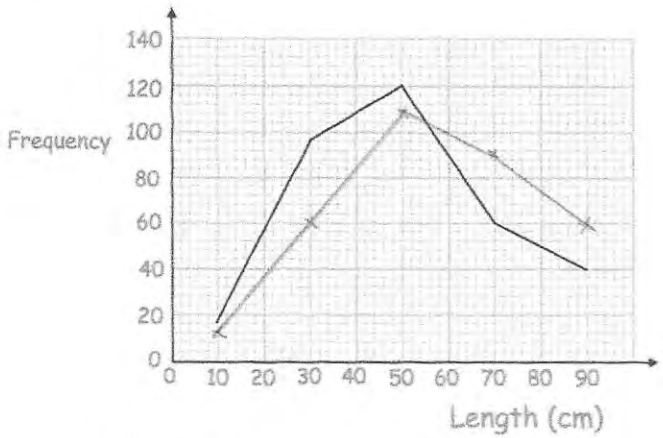
	French	Spanish	German	Welsh	Total
Year 10	18	5	12	21	56
Year 11	9	12	24	19	64
Total	27	17	36	40	120

64

.....

(3)

25. The frequency polygon shows the length of 330 river eels.



The table shows the lengths of 330 sea eels.

Length (cm)	Frequency
$0 < t \leq 20$	12
$20 < t \leq 40$	60
$40 < t \leq 60$	108
$60 < t \leq 80$	90
$80 < t \leq 100$	60

Draw a frequency polygon to show this information on the diagram above.

(2)

26. Orla has four types of vegetable.

Peas
Carrots
Turnip
Spinach

Orla is going to choose 2 different types of vegetable.

Write down all the possible combinations of vegetable she can choose.

Peas + Carrots Peas + Turnip Peas + Spinach

Carrots + Turnip Carrots + Spinach

Turnip + Spinach

(2)

27. Simplify $8a + 3c - 5c + 3a$

11a - 2c

(2)

28. A set of six numbers have a median of 5.
All of the numbers are even.
The range of the numbers is 6.
The mode of the numbers is 4.

Write down a possible set of six numbers.

4, 4, 4, 6, 8 and 10

(4)

29. The number of people visiting a cafe each day, for 11 days, is listed below.

104 131 120 115 109 124 128 118 116 120 125

(a) Complete an ordered stem and leaf diagram for this information.
Include a suitable key.

Key 10|4 means 104

10	4 9
11	5 6 8
12	0 0 4 5 8
13	1

(2)

(b) Write down the mode.

120

(1)

(c) Write down the median.

120

(1)

(d) Write down the range.

131 − 104

27

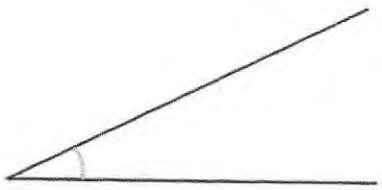
(1)

30. Here is a list of words connected with angles.

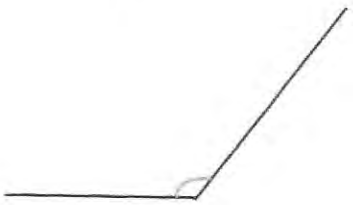
Acute	**Reflex**	**Obtuse**
Right	**Straight**	**Full-turn**

Choose the correct word to describe each angle.

Answer Right..... angle



Answer Acute..... angle



Answer ..obtuse.. angle

Answer Reflex.... angle

(3)

31. (a) Round the number 7.819 to one decimal place.

7.8

(1)

(b) Round the number 7.819 to two decimal places.

7.82

(1)

32. Put brackets in the following statements to make them true

(a) $2 \times 7 + 1 \times 3 = 48$

(1)

(b) $9 + 3^2 \times 10 \div 2 = 90$

(1)

33. A bus to Belfast leaves Antrim Bus Station every 25 minutes.
The first bus each day leaves at 7am.
Darren wants to get a bus after 8am.

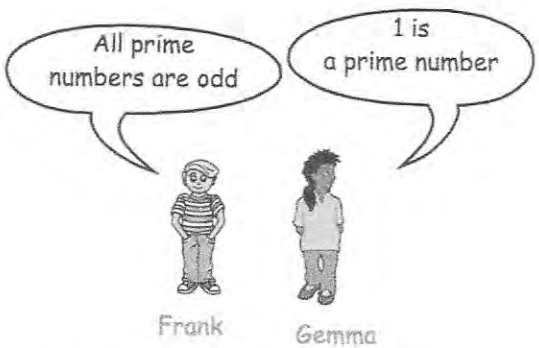
What time is the first suitable bus?

25 50 75

1 hour 15 minutes 8:15am

(2)

34.



Give a reason why each child is wrong.

Frank: 2 is the only even prime number
So not all primes are odd

Gemma: 1 is not a prime number:
Prime numbers have two factors, 1 and itself.

(2)

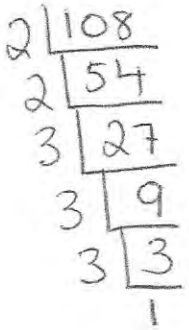
35. William is thinking of two numbers.
Both numbers are square numbers greater than 1.
The sum of the numbers is 100.

Write down the two numbers.

36 and 64

(2)

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



$2 \times 2 \times 3 \times 3 \times 3$

$2^2 \times 3^3$

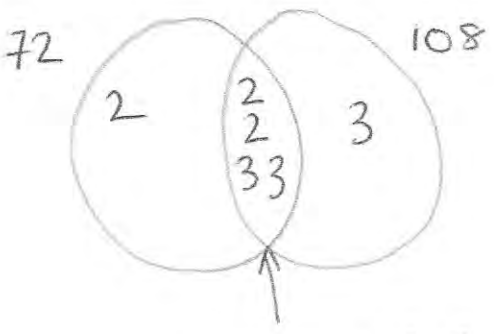
$2^2 \times 3^3$

(3)

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

108: $2 \times 2 \times 3 \times 3 \times 3$

72: $2 \times 2 \times 2 \times 3 \times 3$



HCF: $2 \times 2 \times 3 \times 3 = 36$

36

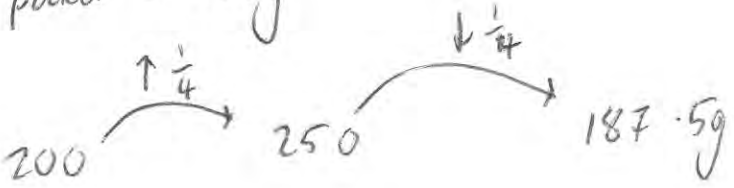
(2)

37. The size of a packet of pasta is increased by one-quarter.
The new size is later reduced by one-quarter.

Is the new packet smaller, the same size or larger than the original?

Explain how you worked out your answer.

let packet = 200g



less, the packet is smaller

(3)

38. The table gives information about the number of people voting for each party at an election.

Party	Number of Votes
Gold Party	12598
Pink Party	9112
Brown Party	20059
Purple Party	4466

46235 voted

There are 52852 people who can vote
The target was that 88% of people would vote.

Was the target met?

88% of 52852 = 46509.76

∴ target not met.

(3)

39. 1,935 people visit a library during one week.
The ratio children : adults is 1 : 4

5 parts

How many more adults than children visited the library?

$1935 \div 5 = 387$

$387 \times 4 = 1548$ – Adults

387 – children

1161 more adults

(3)

40.

$$m = abc$$

Find m if a = 3, b = –8 and c = 2

$m = (3)(-8)(2)$

$= -48$

$m = -48$

(2)

41. A game is played with a five sided spinner.
Each section is a different colour.
The spinner is biased.
The table shows some of the probability of the spinner landing on each colour.

Colour	Red	Blue	Green	Pink	Black
Probability	0.34	0.1	0.22	0.22	0.12

The probability of green is equal to the probability of pink.

Calculate the probability the spinner lands on pink.

0.22

(3)

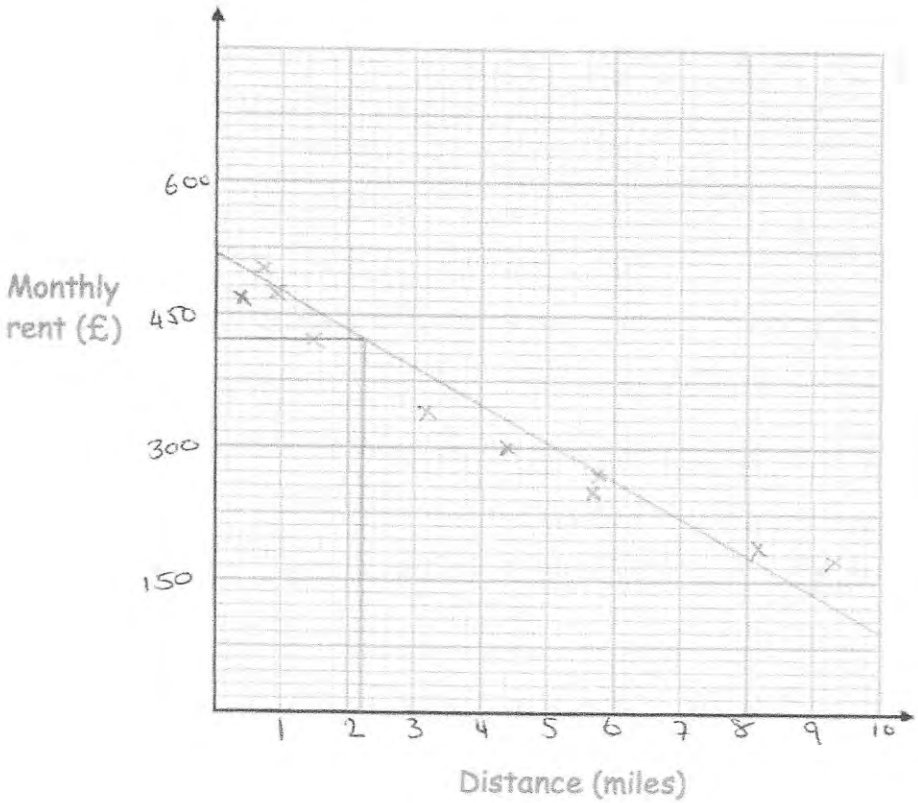
42.

The table below shows information about the monthly rent of an apartment and the distance of the apartment from a city centre, in miles.

Distance (miles)	3.2	1.5	5.7	8.2	0.7	0.9	4.4	5.8	9.3	0.4
Monthly rent (£)	340	420	250	190	500	470	300	260	170	510

(a) Plot the data on the scatter graph below.
Clearly label your axes.

(3)



(b) Describe the relationship between the distance from the city centre and the monthly rent.

The further away from the City centre, the less the rent

(1)

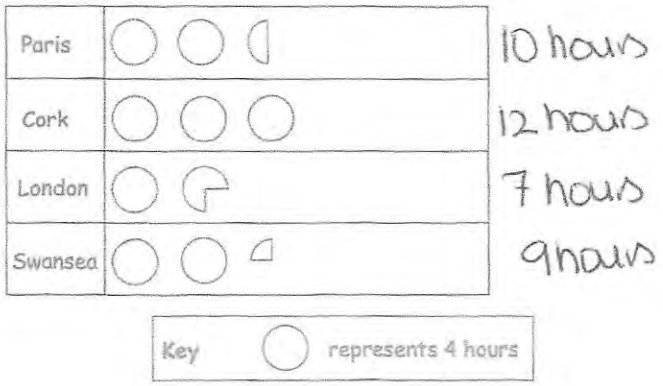
An apartment is 2.2 miles from the city centre.

(c) Find an estimate for the monthly rent

£ 420

(2)

43. The number of hours of sunshine on a day, across a number of cities is shown below.



(a) Which city had the most sunshine?

Cork
(1)

(b) How many hours of sunshine did Swansea have?

9 hours
(1)

(c) How many more hours of sunshine did Paris have than London?

3 hours
(1)

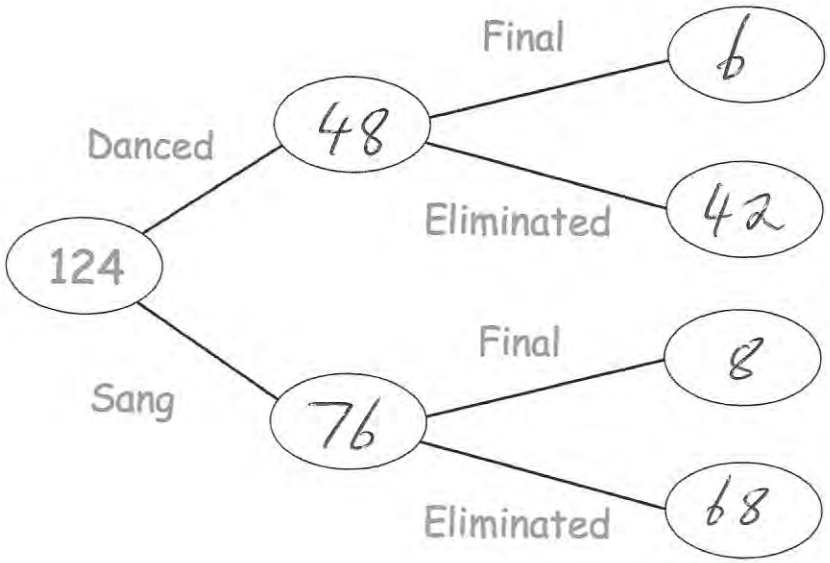
2023

44.

124 people took part in a talent show.
Each person either sang or danced.

76 of the people were singers.
14 people made it through to the final and the rest were eliminated.
6 dancers made it through to the final.

Complete the frequency tree



(2)

---

45. Kelly has two dogs, Pixie and Fifi.

Pixie weighs 8.5 kilograms
Fifi is 720 grams lighter than Pixie.

Work out how much Fifi weighs.
State your units.

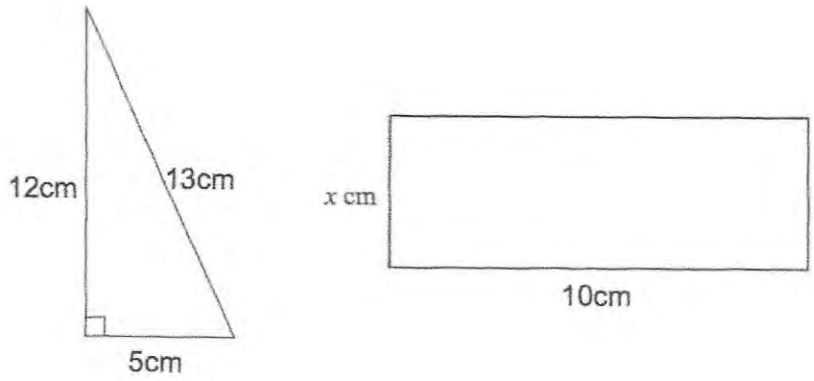
$8.5\text{kg} = 8500\text{g}$

$8500 - 720 = 7780\text{g}$

7.78 kg

(3)

46. Below is a right-angled triangle and a rectangle.



The area of the right-angled triangle is equal to the area of the rectangle.

Calculate x

$\frac{1}{2}(5 \times 12) = 30cm^2$

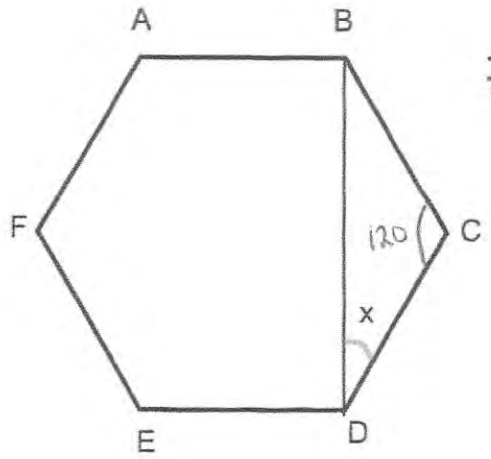
$10x = 30$

$x = 3cm$

.....3.....cm

(4)

47. Shown below is a regular hexagon ABCDEF.



$720 \div 6 = 120$

Calculate angle x.

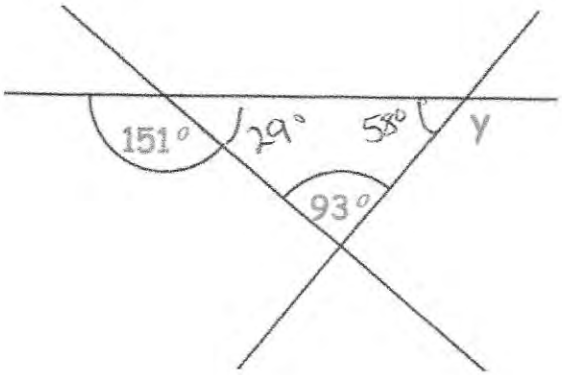
$180 - 120 = 60$

$60 \div 2 = 30$

x = 30.....°

(3)

48. Below are 3 straight lines.



Find the size of angle y.

$180 - 151 = 29°$

$180 - (93 + 29) = 58$

$180 - 58 = 122°$

y = 122°

(3)

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.

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

Conor: $t = \frac{20}{40} = 0.5$ hours

Kelly $t = \frac{20}{50} = 0.4$ hours

0.5 hours = 30 minutes

0.4 hours = 24 minutes

6 minutes

(3)

50.

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
	72

Midpoints	fx
22.5	270
27.5	660
32.5	552.5
37.5	562.5
42.5	170
	2215

Calculate an estimate of the mean mass.

$\frac{2215}{72} = 30.763...$

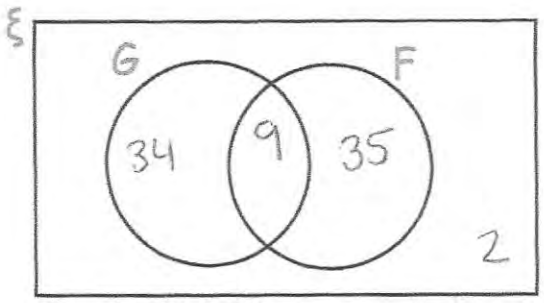
.....30.8.....kg

(3)

51. There are 80 students in year 11.

9 students study French and German.
35 students only study French
2 students do not study French or German.

(a) Complete the Venn diagram



(2)

(b) Work out how many students study only German.

$80 - 9 - 35 - 2 = 34$

.....34.....

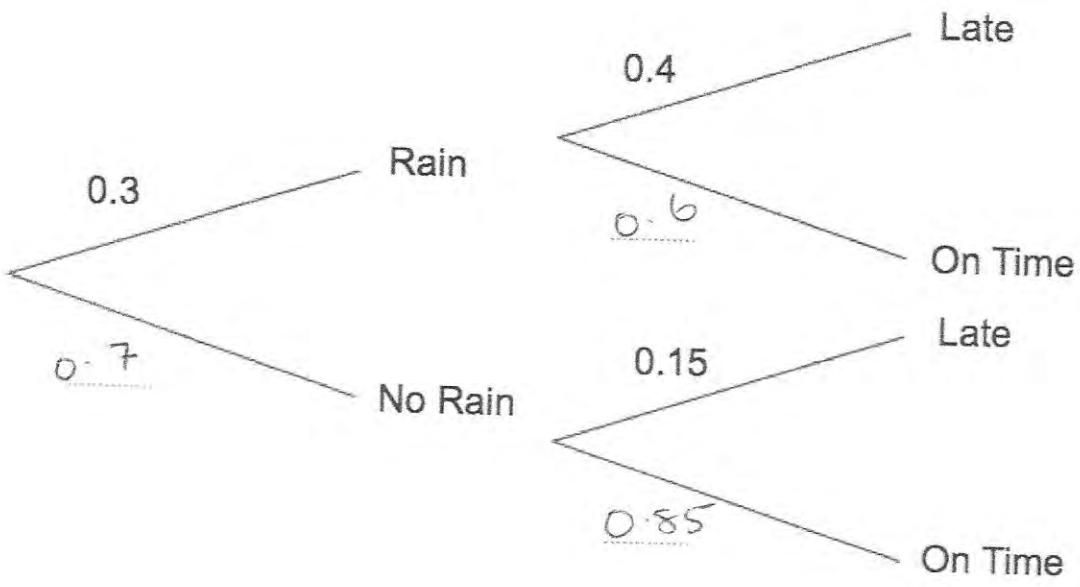
(1)

52. 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 will be late over a period of 80 days.

$P(RL) = 0.3 \times 0.4 = 0.12$

$P(NRL) = 0.7 \times 0.15 = 0.105$

$0.12 + 0.105 = 0.225$

$0.225 \times 80 = 18$

18 days

(3)

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

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

The exchange rate is £1 = ¥168

How many ¥1000 notes should he get?

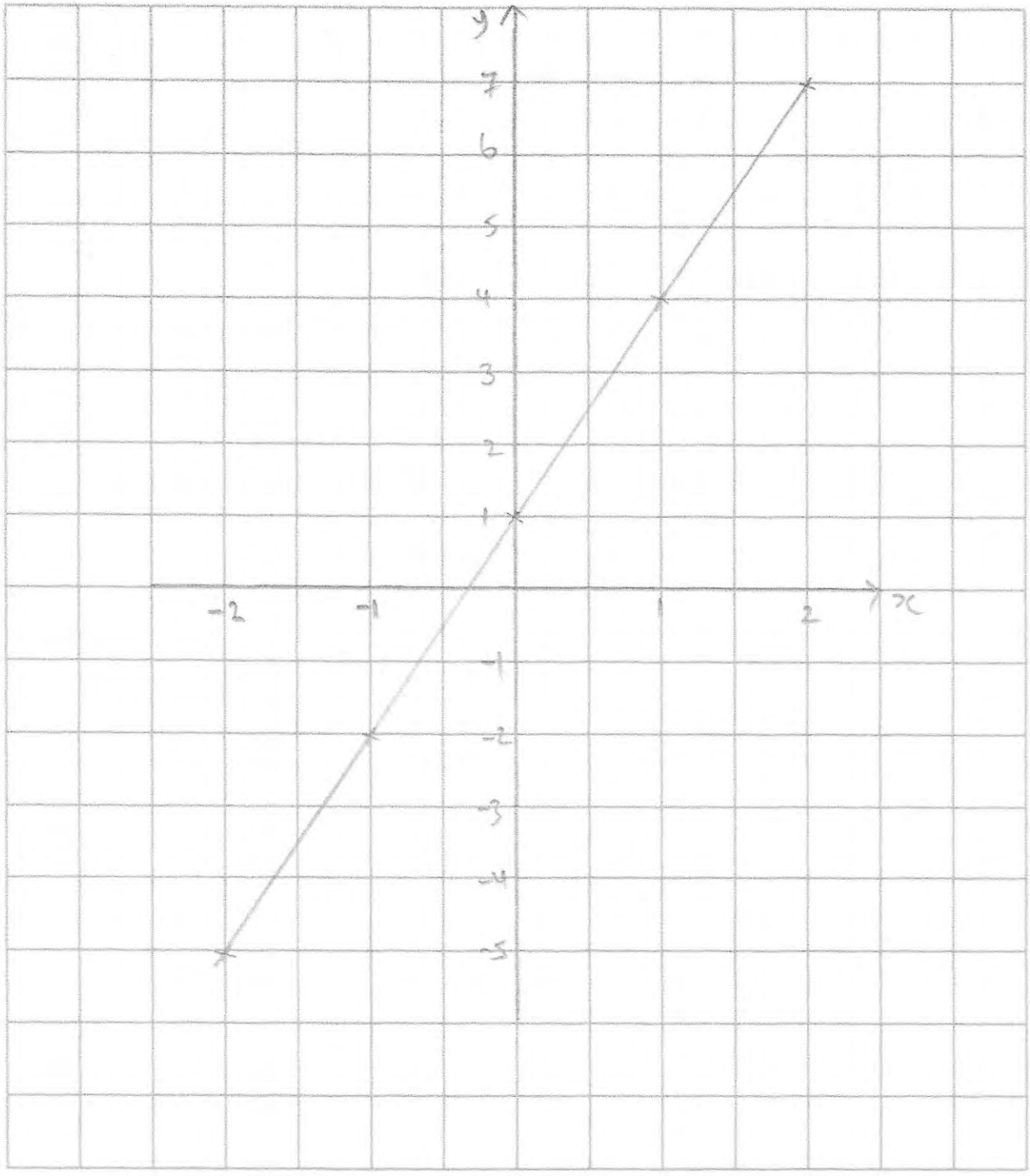
$300 \times 168 = ¥50400$

max ¥50,000 ∴ 50 notes

.....50 notes.....
(3)

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

x	-2	-1	0	1	2
y	-5	-2	1	4	7



(4)

55. A lamp is on sale at £22.05
This is a 10% reduction of the normal price.

What was the price of the lamp before the reduction?

90% = 22.05

1% = 0.245

100% = 24.5

£ 24.50

(3)

---

56. A box contains yellow beads and blue beads.

The ratio of yellow beads to blue beads in the box is 4 : 5
There are 220 yellow beads in the box.

How many beads are in the box?

220 ÷ 4 = 55

55 × 9 = 495

495

(3)

---

57. Alice buys a book for £19.80
A year later she sells the book for £12.87

Calculate the percentage decrease in the value of the book.

$\frac{6.93}{19.80} \times 100 = 35\%$

35 %

(3)

58. Work out

$$10^{-2} = \frac{1}{100}$$

Give your answer as a decimal.

0.01

(2)

59. Expand and simplify $(y - 1)(y - 2)$

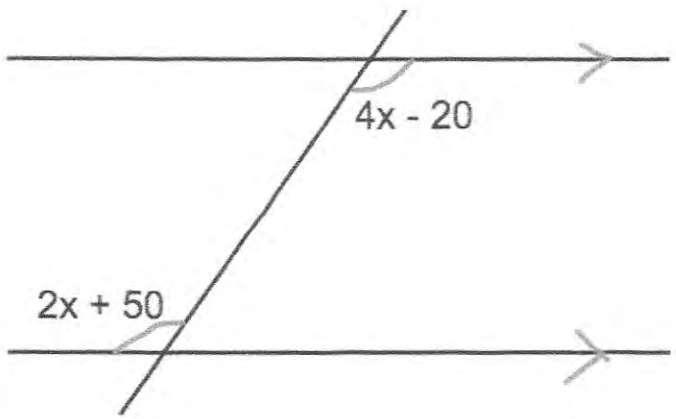
$y^2 - y - 2y + 2$

$y^2 - 3y + 2$

$y^2 - 3y + 2$

(2)

60. The diagram below shows a pair of parallel lines.



Calculate the size of the angle, $2x + 50$.

$2(35) + 50 = 120$

$4x - 20 = 2x + 50$

$2x = 70$

$x = 35$

120°

(4)

61. Here are the first five terms in a number sequence.

7 10 13 16 19 22 25 28 31 34

3 3 3 3

(a) Find the 10th term in this number sequence.

$3n+4$

$3(10)+4=34$

34

(2)

(b) Write an expression, in terms of n, for the nth term of this number sequence.

$3n+4$

(2)

---

62. Factorise

a^2+3a

$a(a+3)$

$a(a+3)$

(1)

---

63. Factorise $x^2-3x-18$

$(x+3)(x-6)$

$(x+3)(x-6)$

(2)

64. A line has equation $y = 3x + 4$

(a) Write down the gradient of the line

3

(1)

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

4 or (0, 4)

(1)

---

65. $-4 \leq n < 1$

n is an integer.

(a) Write down all the possible values of n.

-4, -3, -2, -1, 0

(2)

(b) Solve the inequality $4x + 11 < 27$

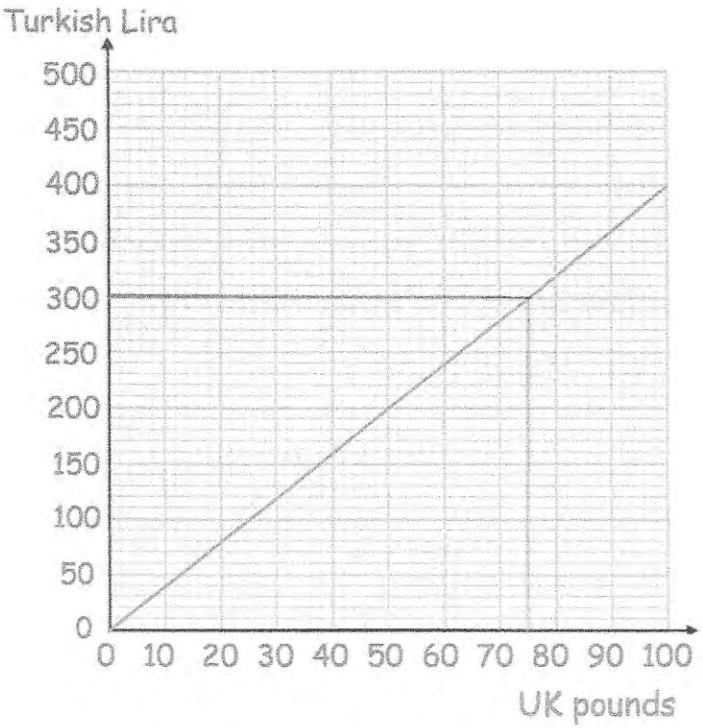
$4x < 16$

$x < 4$

$x < 4$

(2)

66.



Richard has ₺300 and £800.
He buys a flight that costs ₺900

He pays use the ₺300 and some of the pounds.

Work out how many pounds he has left.

900 − 300 = 600

300 turkish lira = £75

600 turkish lira = £150

800 − 150 = 650

£ 650

(3)

67. Factorise $c^2 - 36$

$(c + 6)(c - 6)$

$(c+6)(c-6)$

(1)

68. 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.

$1600 \times 1.04^4 = 1871.7736...$

£1871.77

(3)

---

69. The table gives the circumference, in metres, of planets in the solar system.
The circumferences are given to an accuracy of 3 significant figures.

Planet	Circumference (metres)
Mercury	1.54×10^7
Venus	3.81×10^7
Earth	4.01×10^7
Mars	2.13×10^7
Jupiter	4.39×10^8
Saturn	3.66×10^8
Uranus	1.59×10^8
Neptune	1.55×10^8

(a) Which planet has the largest circumference?

Jupiter

(1)

(b) Which planet has the smallest circumference?

Mercury

(1)

(c) Write 1.54×10^7 as an ordinary number.

154 00 000

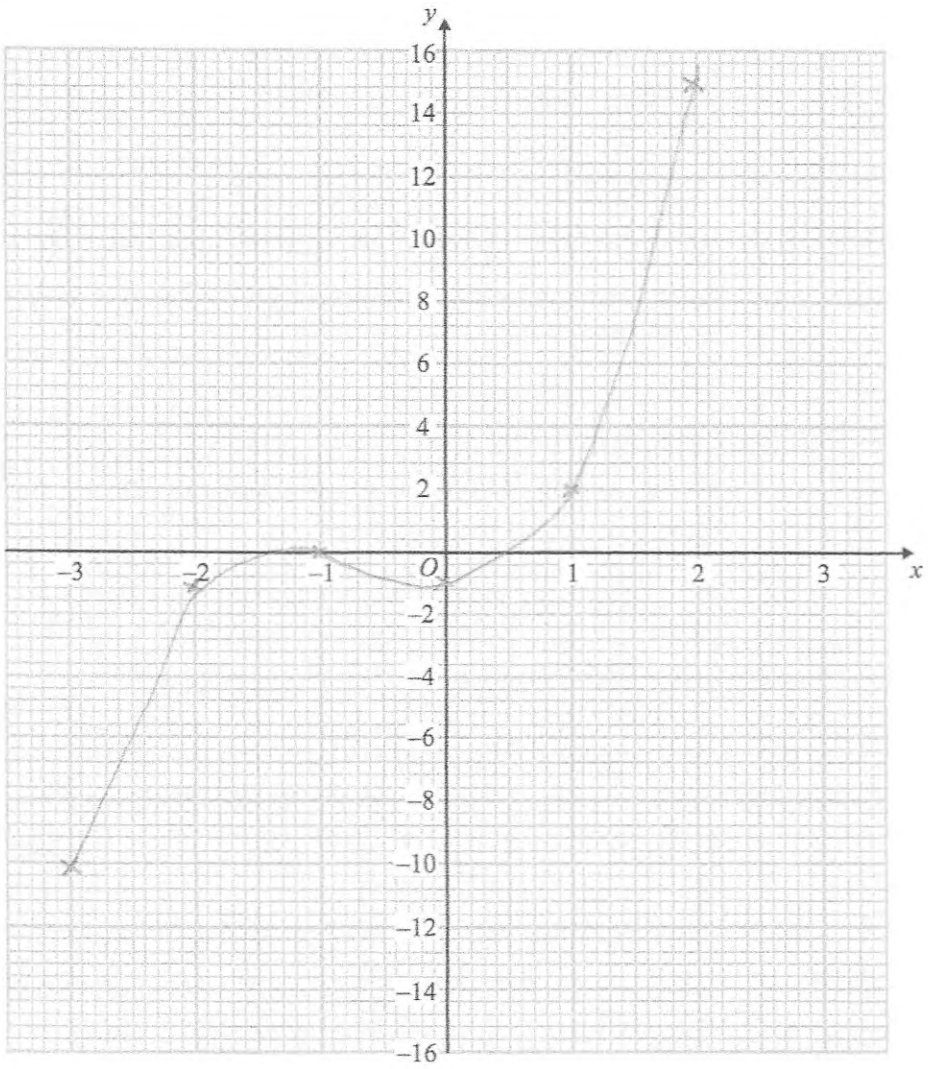
(1)

70. (a) Complete the table of values for $y = x^3 + 2x^2 - 1$

x	-3	-2	-1	0	1	2
y	-10	-1	0	-1	2	15

(2)

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



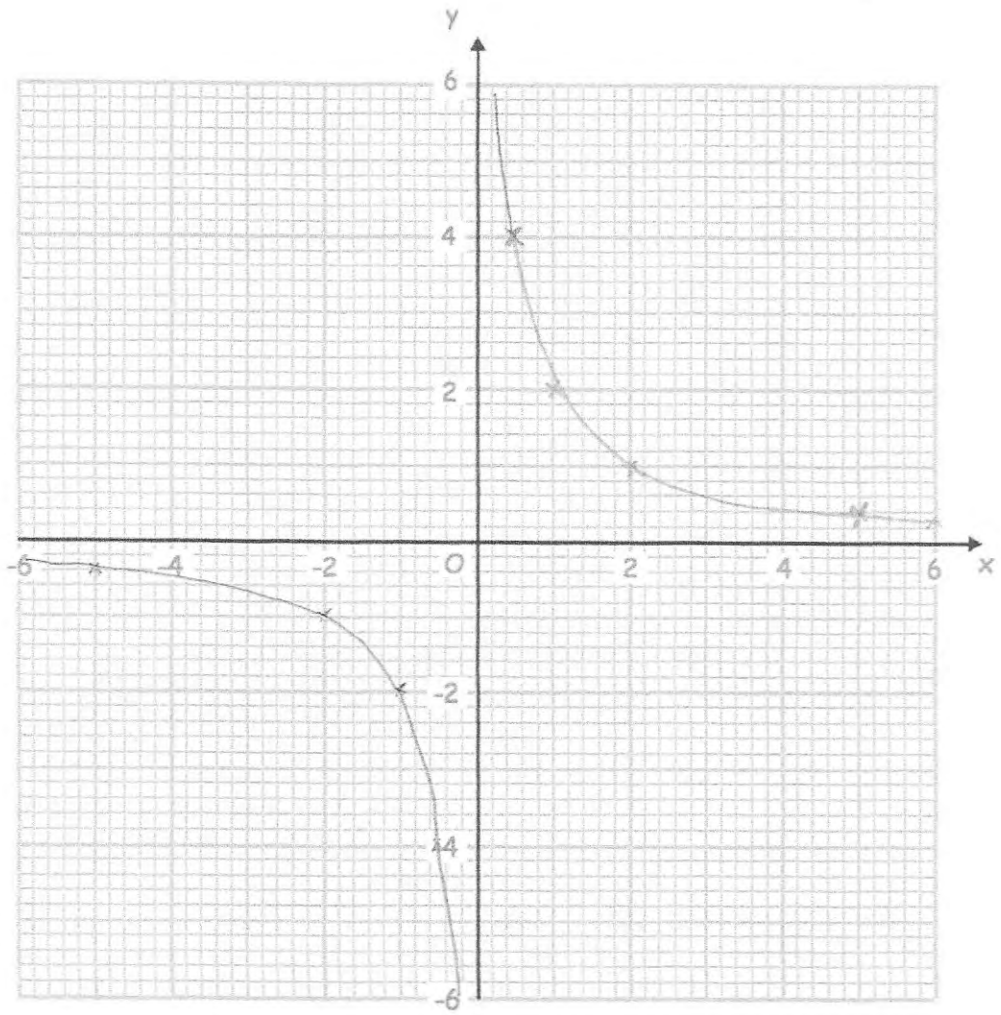
(2)

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

x	-5	-2	-1	-0.5	0.5	1	2	5
y	-0·4	-1	-2	-4	4	2	1	0·4

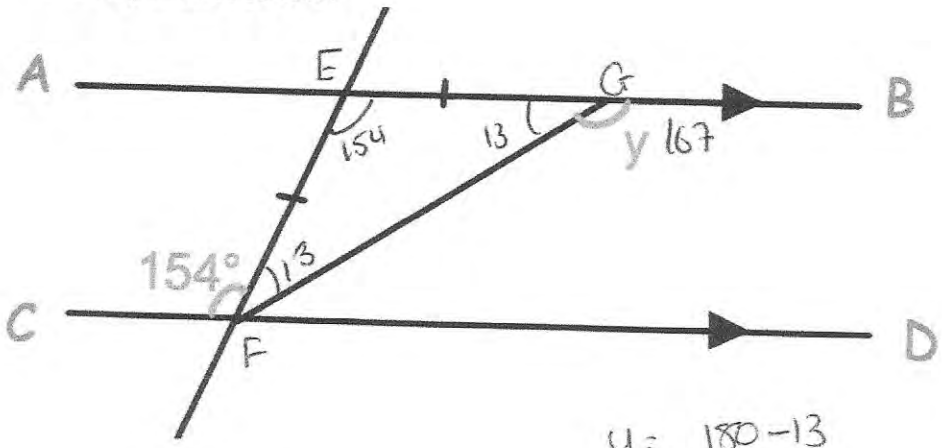
(2)

(b) On the grid, draw the graph of $y = \frac{2}{x}$ for $0.5 \leq x \leq 10$



(2)

72. AB is parallel to CD.



$y = 180 - 13$
$= 167°$

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

$C\hat{F}E = F\hat{E}G$ as they are alternate angles

The triangle is isosceles therefore $E\hat{F}G$ and $E\hat{G}F$ are equal.

Angles in triange add to 180° so $180 - 154 = 26°$

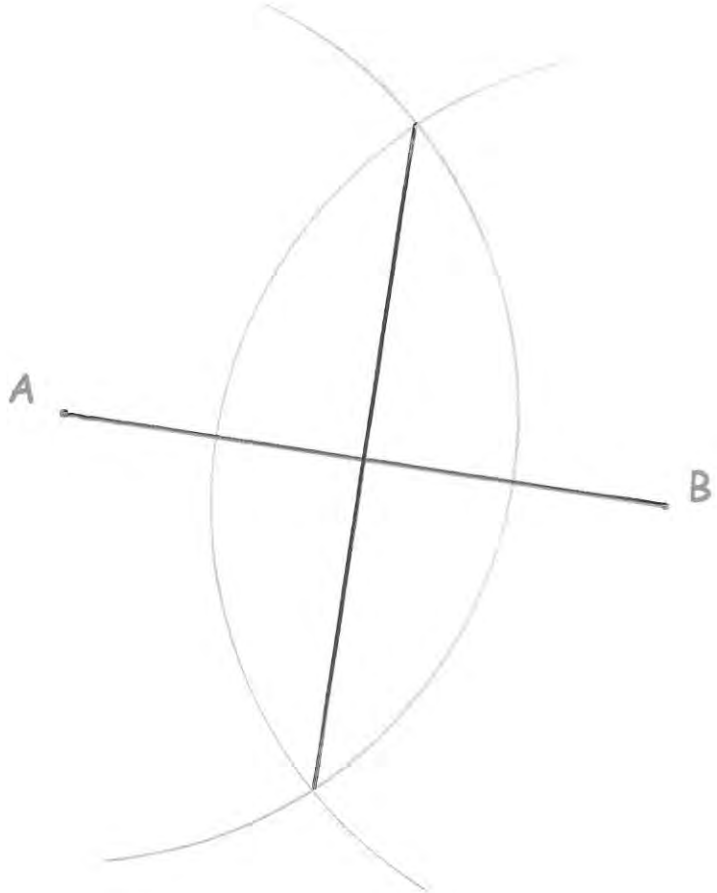
$26 \div 2 = 13°$

Angles EGF and BGF are in a straight line so they must add to 180°, so $y = 167°$

167 °

(4)

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

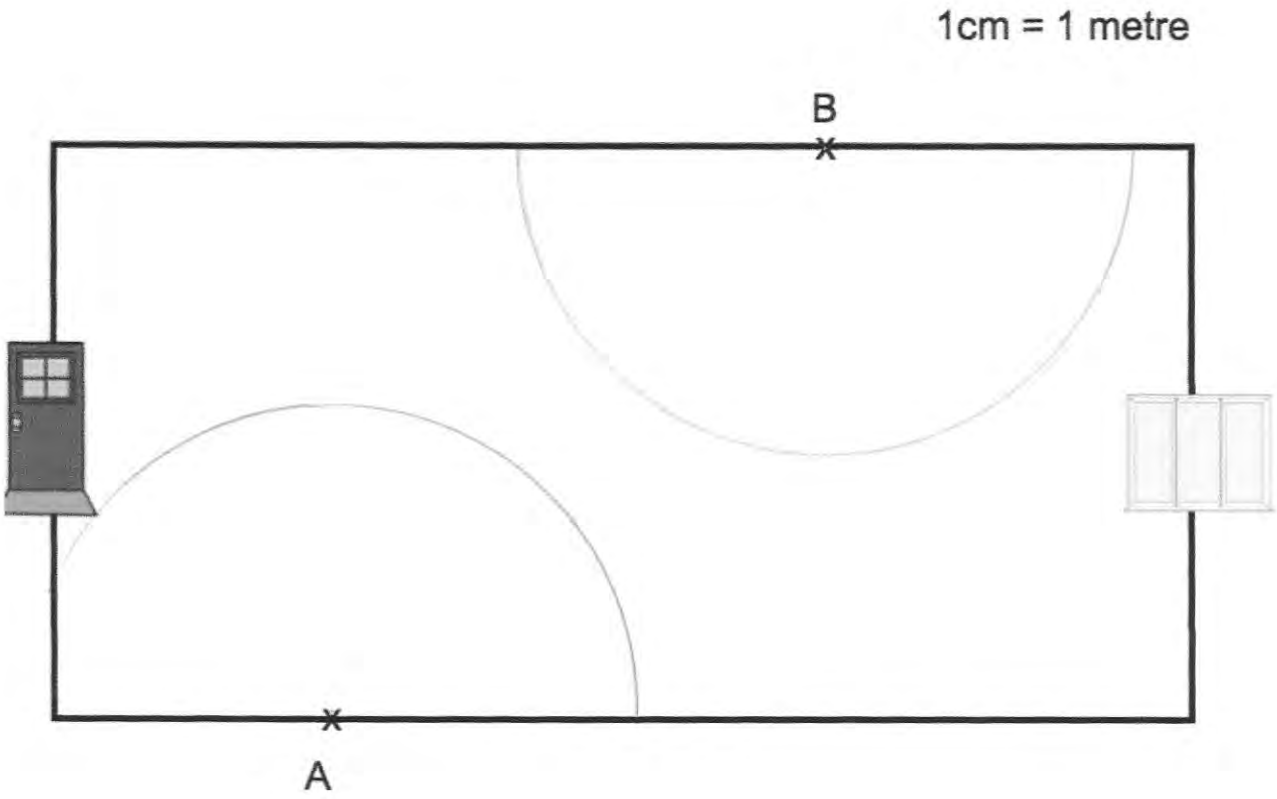


(2)

74. Below is a diagram of a hall.

There is a front door at one end of the hall and a patio door at the other.
There are two burglar alarm sensors, one at A and one at B.

The range of each sensor is 4m.



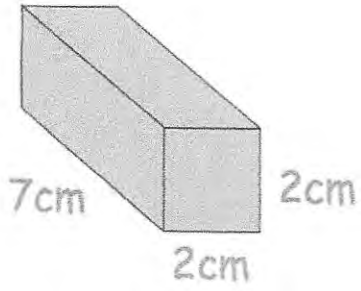
The alarm is switched on.

Is it possible to walk from the front door to the patio door without setting off the alarm?

Yes

(3)

75.



Find the surface area of this cuboid.
Include suitable units.

$2 \times 2 = 4cm^2$ $7 \times 2 = 14cm^2$
$4 \times 2 = 8cm^2$ $14 \times 4 = 56cm^2$

$56 + 8 = 64cm^2$

64cm²

(3)

76. A solid silver spoon has a mass of 65.1g.
The volume of the spoon is 6.2cm³.
Calculate the density of silver.

$D = \frac{m}{V} = \frac{65.1}{6.2} = 10.5$

10.5 g/cm³

(2)

77. A cylinder is placed on a table.
The cylinder has a weight of 400N and has a diameter of 10cm.

Work out the pressure on the table in newtons/cm²

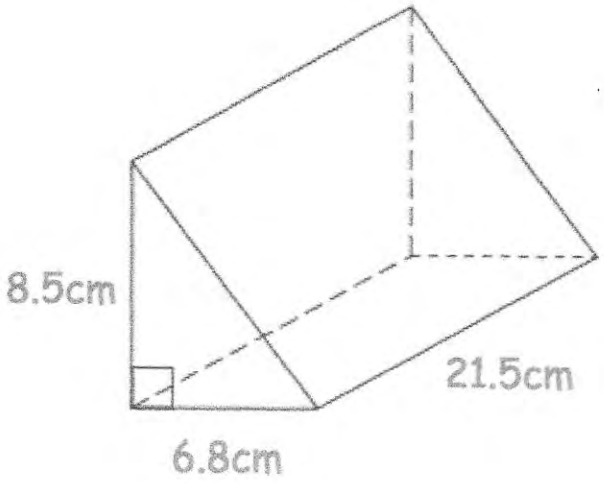
Area $= \pi r^2$
$= \pi(5^2)$
$= 25\pi$

$P = \frac{F}{A} = \frac{400}{25\pi} = 5.0929...$

5.09 N/cm²

(2)

78. Shown below is a triangular prism.



Find the volume of the triangular prism.

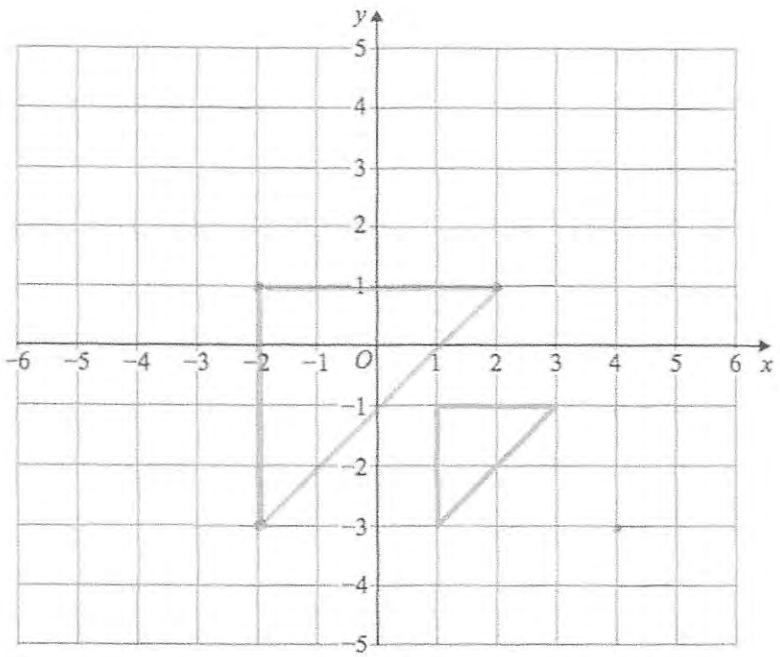
$\frac{1}{2}(6.8 \times 8.5) = 28.9$

$28.9 \times 21.5 = 621.35$

.....621.35.....cm³

(3)

79.



Enlarge by scale factor 2 using
(4, -3) as the centre of enlargement

80.

Work out the circumference of the circle.
Give your answer to 1 decimal place.

$C = \pi d$

$d = 18$

$C = 18\pi$

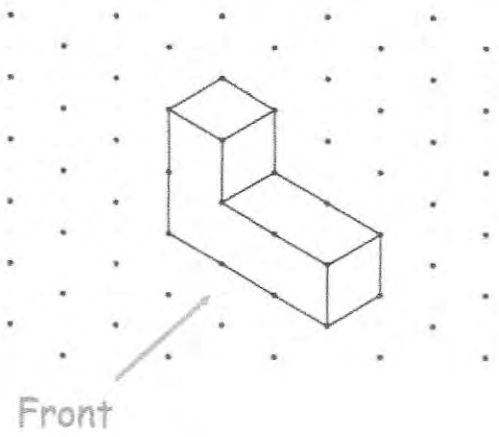
$C = 56.548...$

56.5

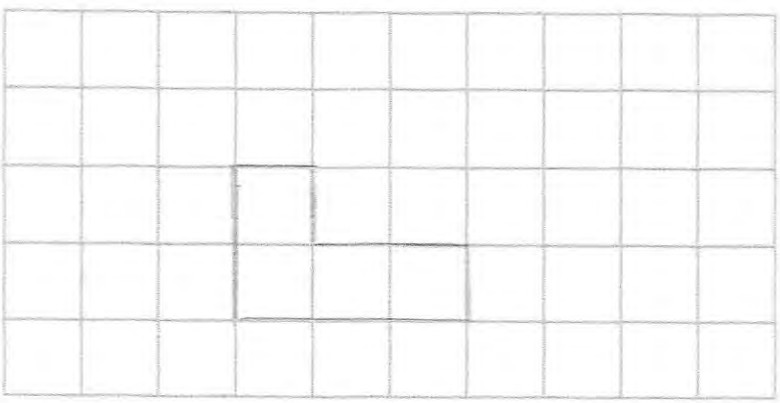
.....cm

(2)

81. The diagram below shows a shape made with centimetre cubes.

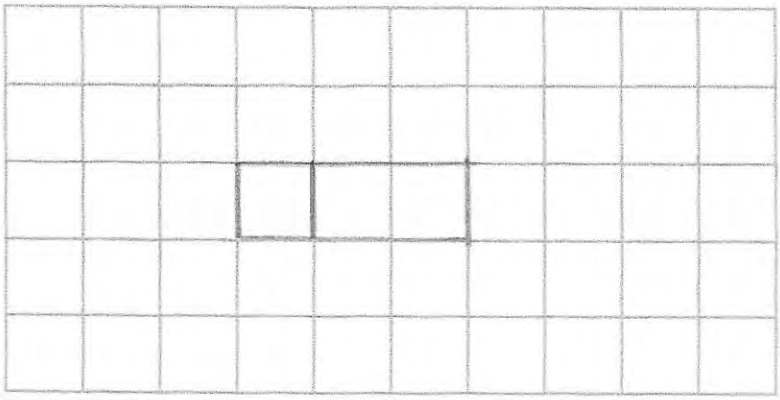


(a) On the centimetre square grid, draw the front elevation.



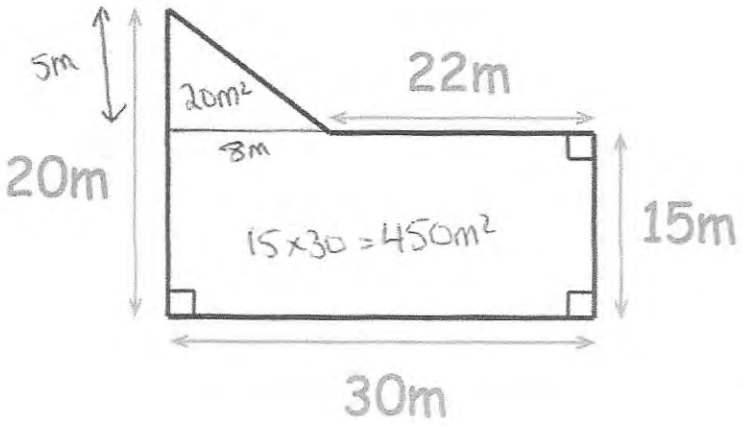
(2)

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



(2)

82.



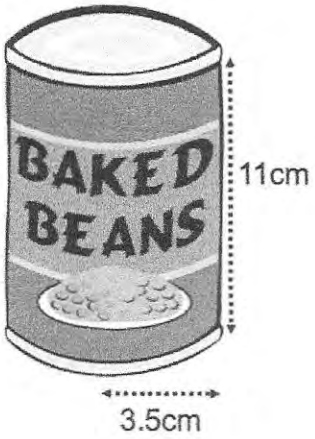
Calculate the area of the field.

450 + 20 = 470m²

.....470..... m²

(2)

83.



Calculate the volume of the can.

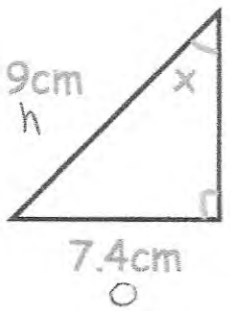
$\pi \times 3.5^2 \times 11$

$= 423.3296...$

423.33 cm^3

(3)

84.



Find the size of angle x

$\sin x = \frac{7.4}{9}$

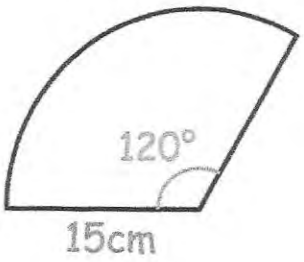
$x = \sin^{-1}\left(\frac{7.4}{9}\right)$

$x = 55.3078...$

55.31°

(3)

85.



$P = 15 + 15 + 31.4159...$

$P = 61.4159...$

Calculate the perimeter.

$\frac{120}{360} \times \pi \times 30$

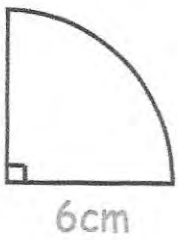
$= \frac{1}{3}\pi \times 30$

$= 31.4159...$

.....61.42..... cm

(3)

86.



Calculate the area.

$\frac{90}{360} \times \pi \times 6^2$

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

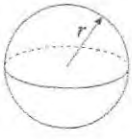
$= 28.27$

.....28.27..... cm^2

(3)

87. Shown is a sphere with radius 8cm.

Surface area of sphere $= 4\pi r^2$



$SA = 4\pi(8)^2$

$SA = 804.2477193$

Calculate the surface area of the sphere.

.....804.25..... cm^2

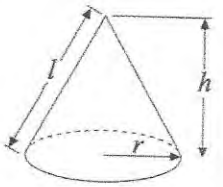
(3)

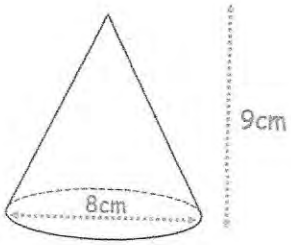
88. A cone has base diameter 8cm.
The height of the cone is 9cm.

Calculate the volume of the cone.

Volume of cone $= \frac{1}{3}\pi r^2 h$

Curved surface area of cone $= \pi r l$





$V = \frac{1}{3} \pi (4)^2 \times 9$

$V = 150.796$

.....150.8.....cm³

(3)

89. Given $\mathbf{a} = \begin{pmatrix} 3 \\ 0 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} 2 \\ 7 \end{pmatrix}$

Work out $2\mathbf{a} + \mathbf{b}$

$\begin{pmatrix} 6 \\ 0 \end{pmatrix} + \begin{pmatrix} 2 \\ 7 \end{pmatrix}$

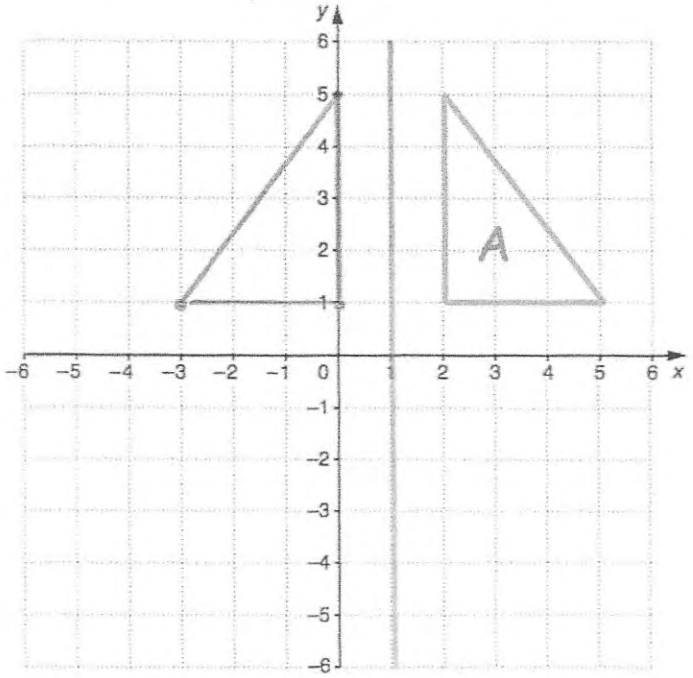
$= \begin{pmatrix} 8 \\ 7 \end{pmatrix}$

$\begin{pmatrix} 8 \\ 7 \end{pmatrix}$

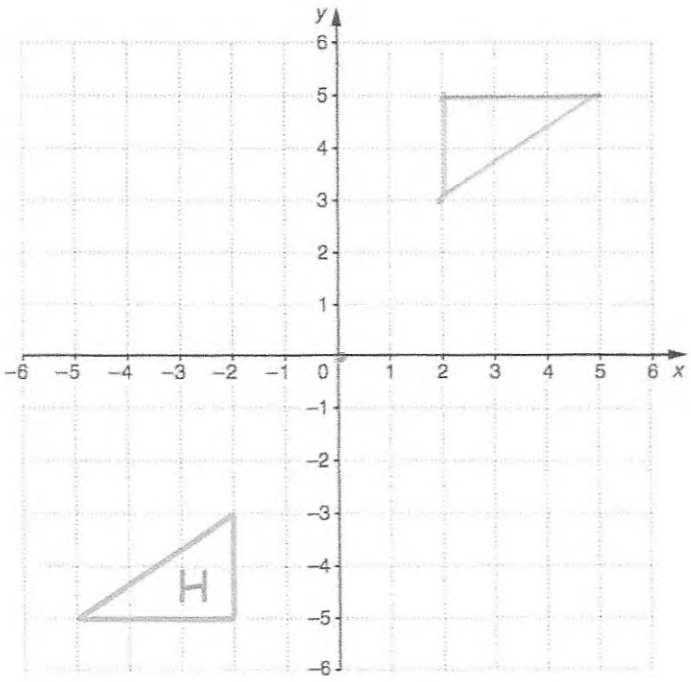
(3)

90.

Reflect shape A in the line $x = 1$

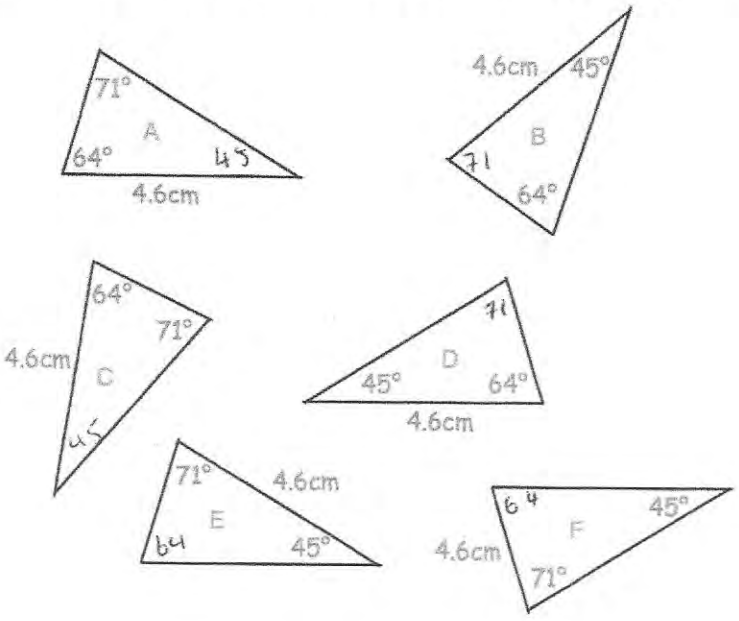


91.



rotate 180° about (0, 0)

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

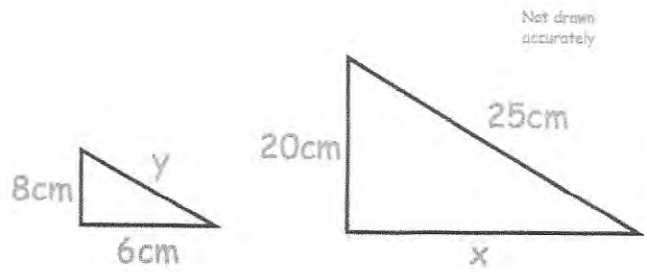


Which two triangles are congruent to triangle A?

.....C..... and .....D.....

(2)

93. Shown below are two similar triangles.



(a) Find the size of x.

$\frac{20}{8} = \frac{x}{6}$ $x = 15$

$8x = 120$

.....15.....cm

(2)

(b) Find the size of y.

$\frac{20}{8} = \frac{25}{y}$ $20y = 200$

$y = 10$

.....10.....cm

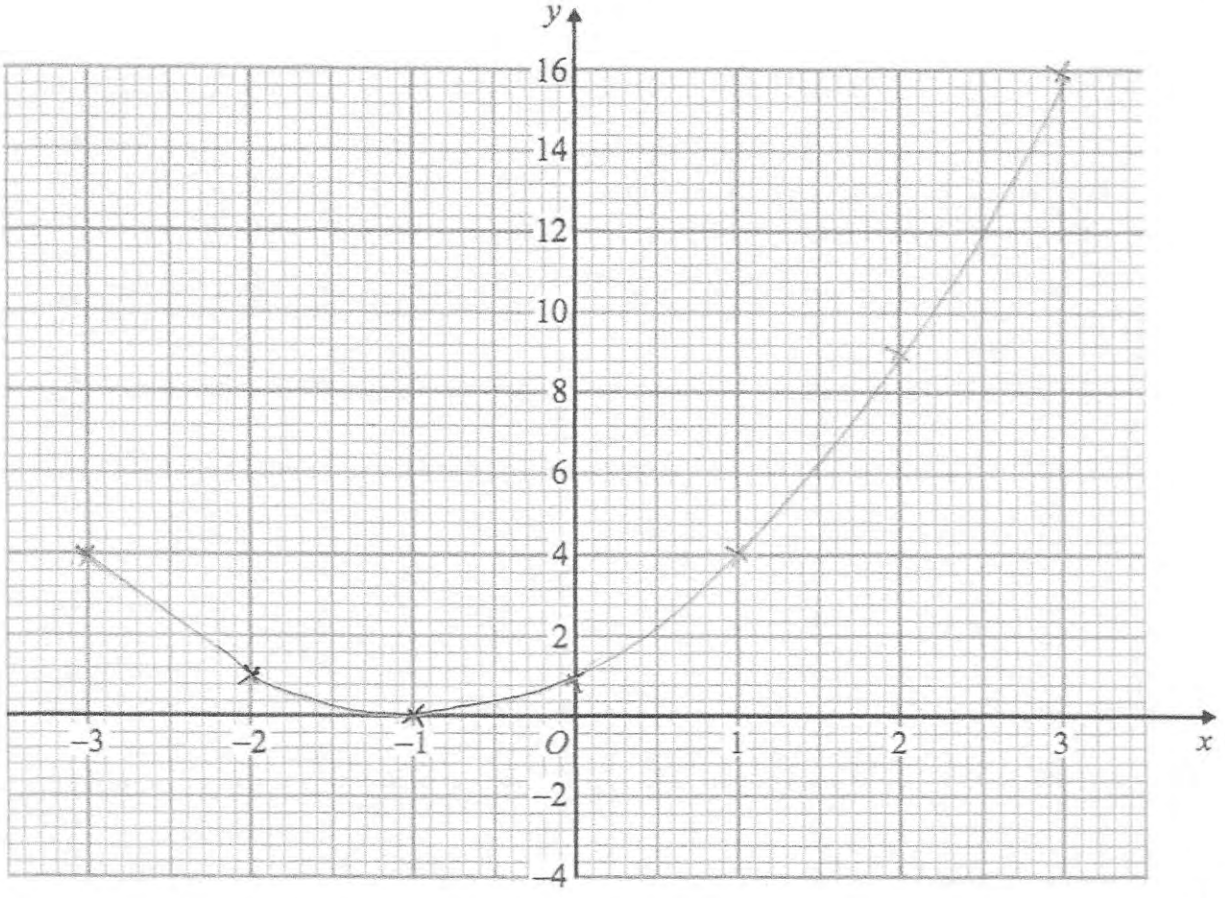
(2)

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

x	-3	-2	-1	0	1	2	3
y	4	1	0	1	4	9	16

(2)

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



(2)

95. Solve the simultaneous equations

$3x + 2y = 16$ ① $\times 2$
$2x - 3y = 2$ ② $\times 3$

Do not use trial and improvement

$6x + 4y = 32$
$(-)\ 6x - 9y = 6$
$13y = 26$
$y = 2$

$3x + 2(2) = 16$
$3x = 12$
$x = 4$

x = 4 y = 2

(4)

---

96. Make v the subject of

$$t = \frac{v}{4} + 1$$

$$\frac{v}{4} = t - 1$$

$$v = 4(t-1)$$

v = 4(t-1)

(2)

or

$v = 4t - 4$

97. Sarah is x years old.
Thomas is 3 years older than Sarah.
David is twice as old as Sarah.
The total of their ages is 51.

(a) Write an expression for Thomas's age in terms of x.

$x + 3$

(1)

(b) Write an expression for David's age in terms of x.

$2x$

(1)

(c) Form an equation in x and solve it to work out Sarah's age.

$x + x + 3 + 2x = 51$

$4x + 3 = 51$

$4x = 48$

$x = 12$

12

(2)

98. Write down the equation of the line that is parallel to $y = 6x + 1$ and passes through (0, 8).

$8 = c$

$y = 6x + 8$

$y = 6x + 8$

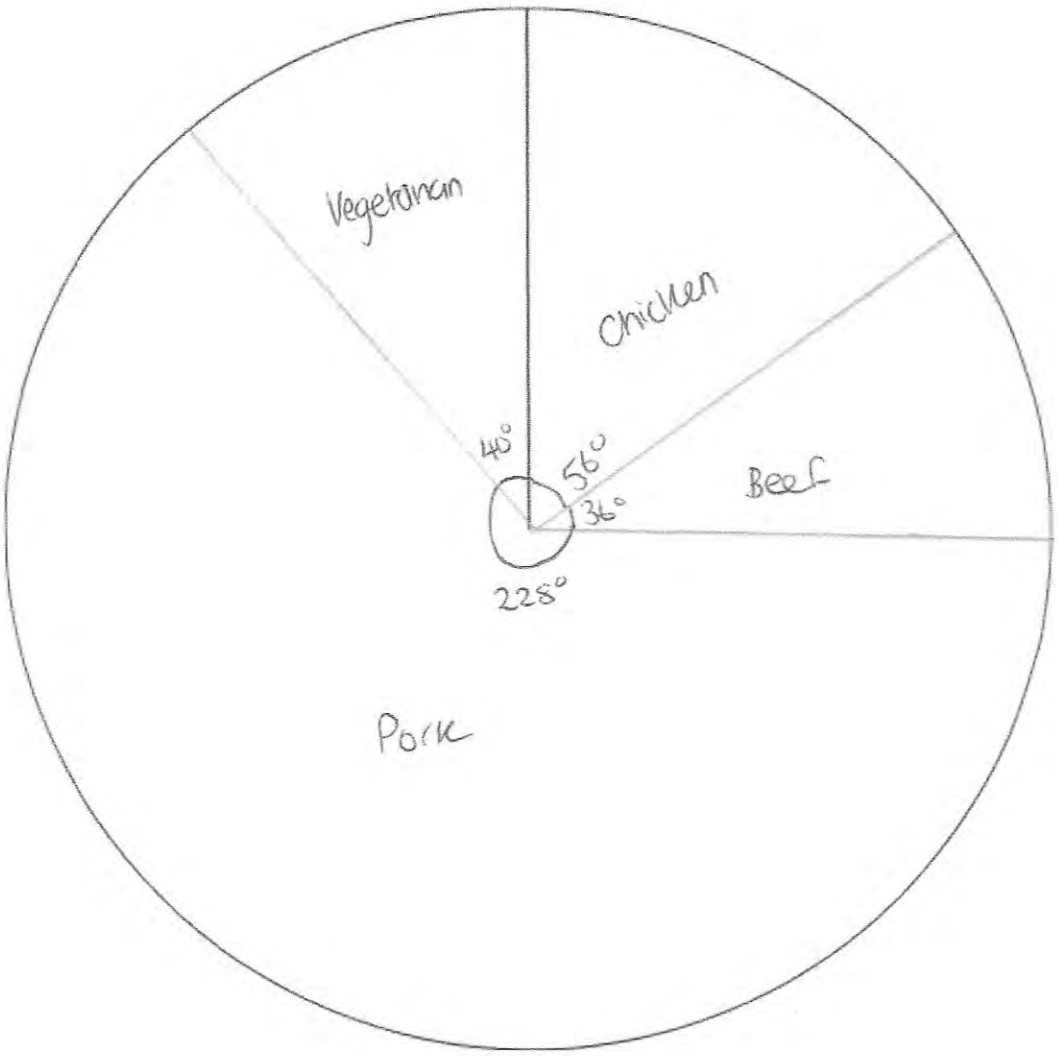
(2)

99. The table gives information about the meals ordered on a Sunday.

Meal	Frequency		Angle
Chicken	14	x4	56°
Beef	9	x4	36°
Pork	57	x4	228°
Vegetarian	10	x4	40°
	90		

360 ÷ 90 = 4°

Draw an accurate pie chart to show this information.



(4)

100. Simplify the following.

$$\frac{s^3 \times s^4}{s^2} = \frac{s^7}{s^2} = s^5$$

s^5

.....

(2)

---

101. Work out the gradient of the line passing through (0, 2) and (4, 14)

$$\frac{14-2}{4-0} = \frac{12}{4}$$

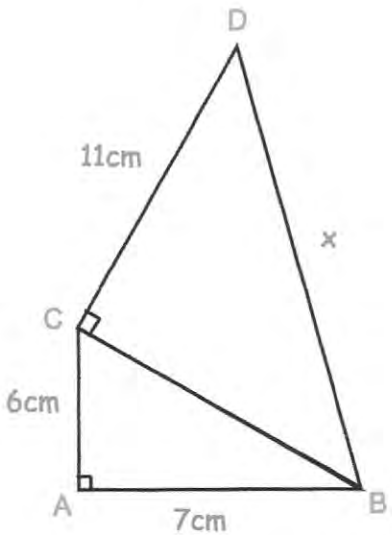
3

.....

(1)

---

102. Below are two triangles, ABC and BCD.



Find x

$6^2 + 7^2 = BC^2$

$36 + 49 = BC^2$

$85 = BC^2$

$BC = \sqrt{85}$

$BC^2 + 11^2 = BD^2$

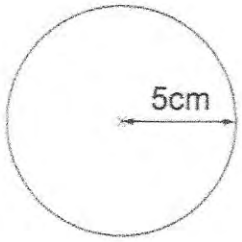
$85 + 121 = BD^2$

$BD = \sqrt{206}$

14.35 .....cm

(4)

103. Shown is a circle with radius 5cm.



Work out the area of the circle.

State the units for your answer.
Give your answer to 2 decimal place.

$A = \pi r^2$

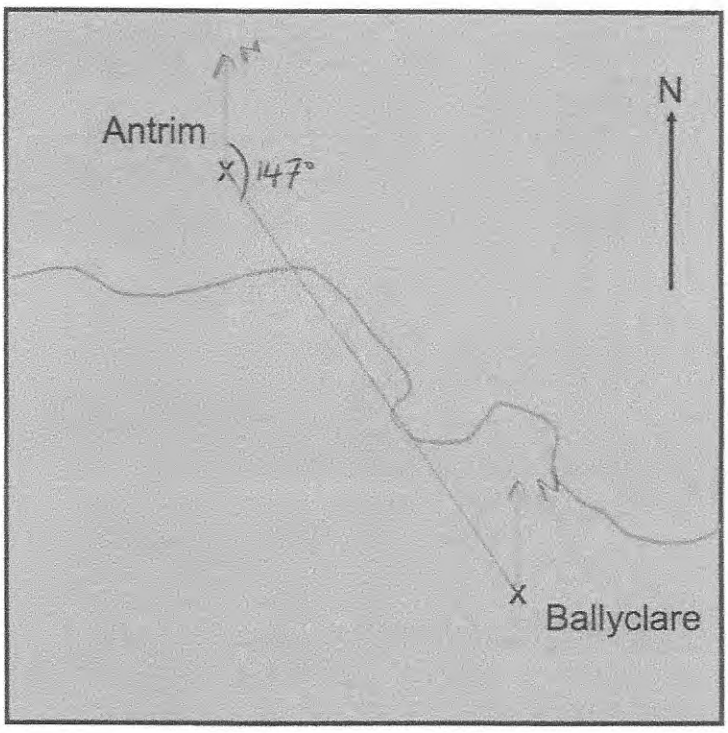
$A = \pi(25)$

$A = 78.5398$

78.54 cm^2

(3)

104. The map below shows the position of two towns.

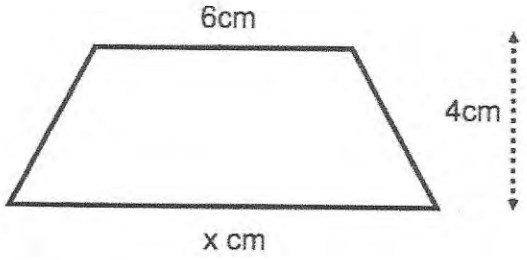


Find the bearing of Ballyclare from Antrim.

147°

(1)

105.



The area of the trapezium is $34cm^2$.

Work out the value of x.

$\frac{1}{2}(a+b) \times h$

$\frac{1}{2}(6+x) \times 4 = 34$

$(6+x) \times 4 = 68$

$6+x = 17$

$x = 11$

.....11.....cm

(2)

106. A number, n, is rounded to 1 decimal place.
The result is 1.8

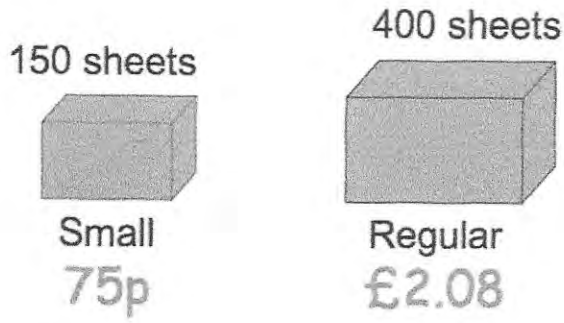
Using inequalities, write down the error interval for n.

$1.75 \leq n < 1.85$

$1.75 \leq n < 1.85$

(3)

107. There are two different packets of the same type of paper in a shop.



Which of the two packets gives the better value for money?
You must show your working.

LCM of 150 and 400 = 1200

£0.75 × 8 = £6
£2.08 × 3 = £6.24
} Therefore the small packet is better value.

(4)

108. Use your calculator to work out the value of

$$\sqrt[3]{(25.4 - 5.9)^2}$$

Give your answer to 3 decimal places.

7.245

(3)

109. Geraint has 2p and 50p coins in the ratio 20 : 3

Write the ratio of the value of the 2p coins to the value of 50p coins in its simplest form.

$20 \times 2 = 40$

$50 \times 3 = 150$

$40 : 150$

$4 : 15$

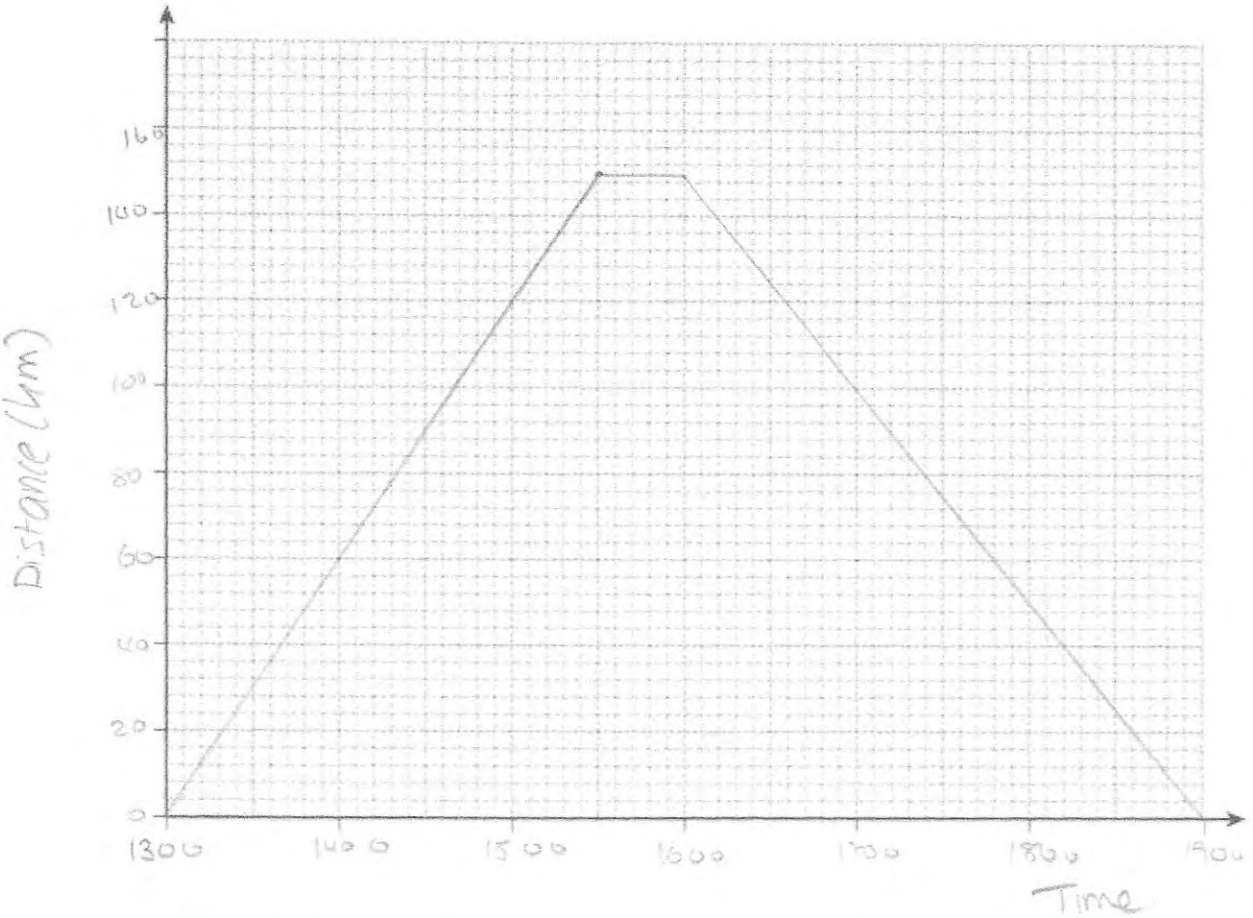
$4 : 15$

.....

(3)

110

AA. Teddy leaves home at 13:00
He drives at an average speed of 60km/h for 2½ hours $60 \times 2.5 = 150$km
Teddy stops for 30 minutes.
He then drives home at an average speed of 50km/h



(a) Show this information on a distance-time graph.

(4)

(b) A film starts at 18:45

Does Teddy get home in time for the start?
Explain your answer.

No, he arrives home at 19:00

(1)

111. The length of a rectangle is 13.6 cm
The perimeter of the rectangle is 37.8cm

Calculate the width of the rectangle.

$13.6 + 13.6 = 27.2$ cm

$37.8 - 27.2 = 10.6$ cm

$10.6 \div 2 = 5.3$

5.3

.....cm

(3)

112. The number of months, m, to complete a piece of research

is found by $m = \frac{400}{n}$

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

How long should the research take if 8 scientists are working on it?

$\frac{400}{8} = 50$ months

.....