ADA PINPOINT PACKS

60_to_84_Percent_Pinpoint_AI_Pack

Made for Grade4to5_Paper3

AO1,2_and_3

ALL_Strands

Calc_Only

Created by A.D.A:

Pinpoints Automatic Differention Algorithmn

Designed and Programmed by

Tom Quilter, Anne Mcateer + Jon Hargreaves ... All maths teachers.

Question 1 (AO1): 39% of students got this right

11. Here is a number machine.

(*a*) Work out the output when the input is 5.

.....

(1)

(*b*) Work out the input when the output is –5.

.....

(2)

The input is x and the output is y.

(*c*) Write y in terms of x.

.....

(2)

(Total 5 marks)

Question 2 (AO1): 39% of students got this right

11. Robbie needs to record 20 minutes of music to play in his restaurant.
He has already recorded the following music.

Playing time

Track 1: 5 minutes 30 seconds

Track 2: 3 minutes 45 seconds

Track 3: 4 minutes 40 seconds

Track 4: 3 minutes 36 seconds

How much more music does he need to record?
Give your answer in minutes and seconds.

..... minutes ..... seconds

(Total 3 marks)

Question 3 (AO1): 37% of students got this right

Shunya is going to spin the spinner 200 times.

18. (b) Work out an estimate for the number of times the spinner will land on 3

Question 4 (AO2): 36% of students got this right

19 Boxes of chocolates cost £3.69 each.
A shop has an offer.

Boxes of chocolates

3 for the price of 2

Ali has £50
He is going to get as many boxes of chocolates as possible.

How many boxes of chocolates can Ali get?

Question 5 (AO1): 35% of students got this right

12 Work out the value of $\frac{\sqrt{5.5}+1.5}{3.25}$

Give your answer correct to 2 decimal places.

.....

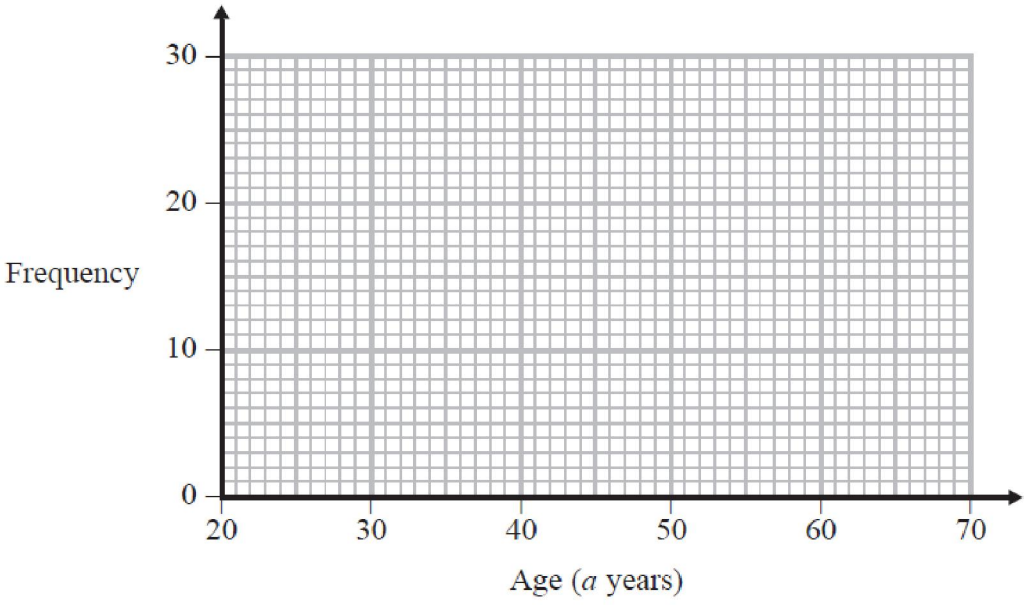
(Total for Question 12 is 3 marks)

Question 6 (AO1): 34% of students got this right

13. The table shows some information about the ages of 60 teachers.

Age (a years)	Frequency
$20 < a \leq 30$	6
$30 < a \leq 40$	16
$40 < a \leq 50$	14
$50 < a \leq 60$	22
$60 < a \leq 70$	2

(b) Draw a frequency polygon for the information in the table.



(2)

(Total 3 marks)

Question 7 (AO1): 33% of students got this right

11 Daniel's height is 6 feet 3 inches.

1 foot = 12 inches

(*b*) What is Daniel's height in centimetres?

..... centimetres

(3)

(Total for Question 11 is 4 marks)

Question 8 (AO3): 32% of students got this right

14. Bill has some models of meerkats.

He has models of meerkat children and models of meerkat adults.

Bill has twice as many models of meerkat children as models of meerkat adults.

He has a total of 30 models.
Each model meerkat child has a value of £2.80

Bill's models have a total value of £98.00
Each model meerkat adult has the same value.

Work out the value of a model of a meerkat adult.

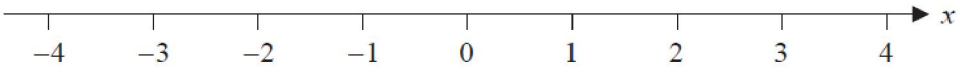
meerkat

£ .....

(Total 4 marks)

Question 9 (AO1): 30% of students got this right

22 a Here is a number line.



(a) On this number line, show the inequality $-1 \leq x < 4$

(2)

Question 10 (AO1): 29% of students got this right

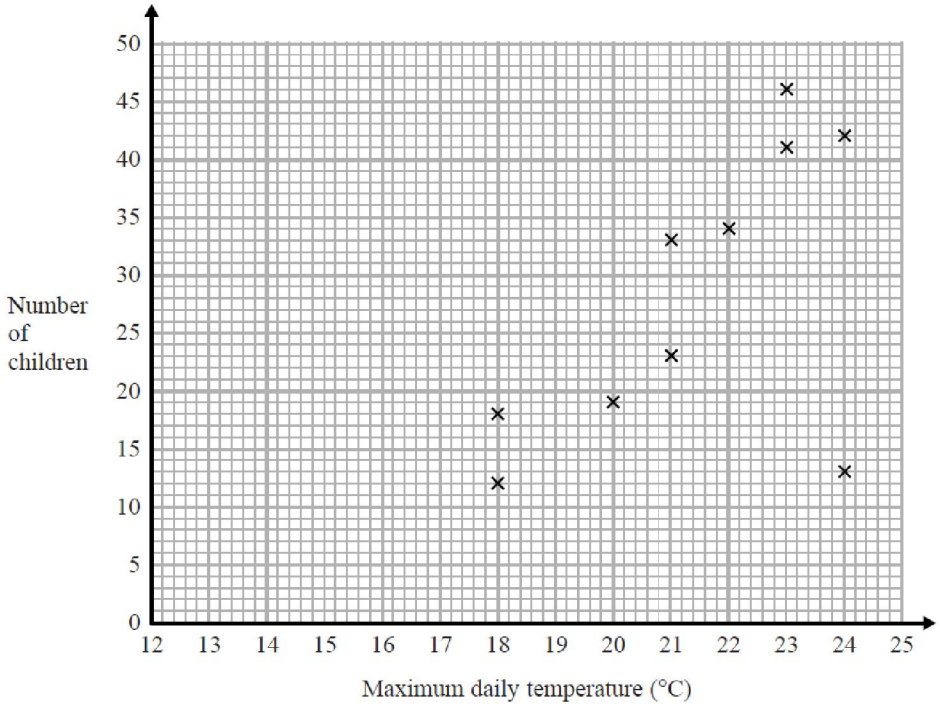
17. (a) Expand and simplify $(x + 9)(x - 3)$

.....

(2)

Question 11 (AO1): 29% of students got this right

25a Johan records the maximum daily temperature each day for 10 days.
He also records the number of children going to a park for each of these days.
He draws this scatter graph for his information.



Johan's information for one of these days is an outlier on the scatter graph.
(a) Give a possible reason for this.

.....

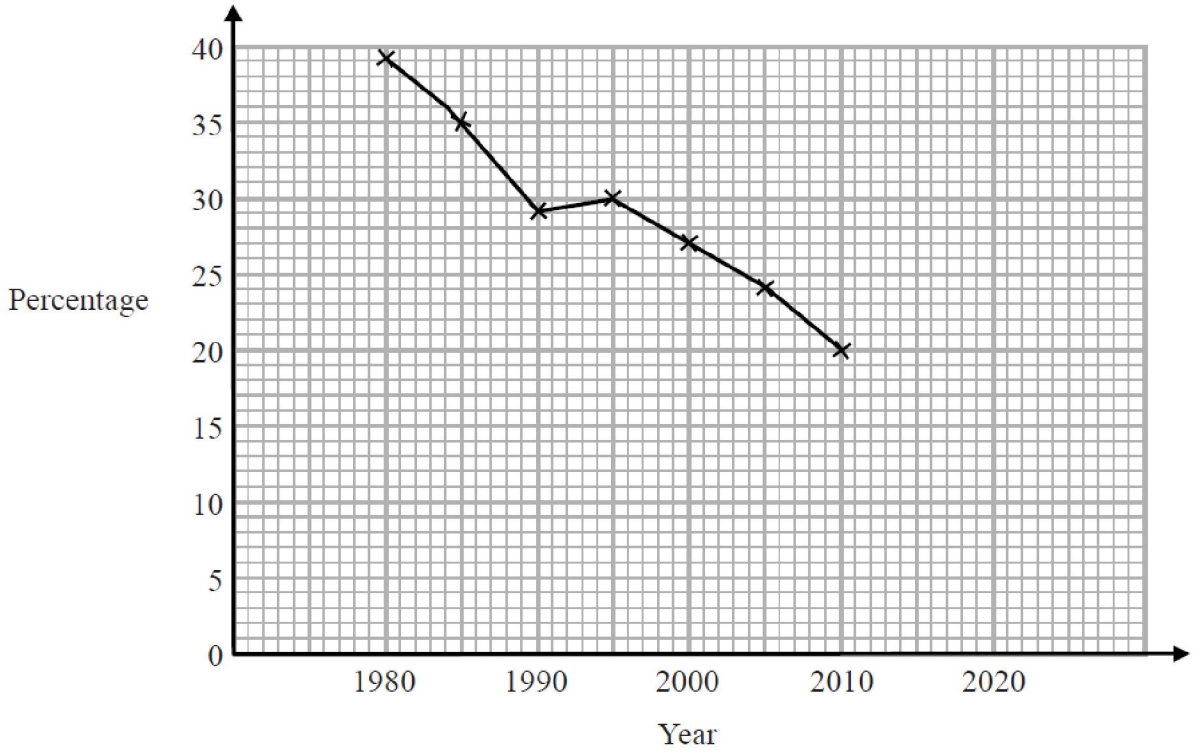
.....

.....

(1)

Question 12 (AO2): 28% of students got this right

23 The time series graph shows information about the percentages of the people in a village that used the village shop for the years between 1980 and 2010.



(*a*) Describe the trend in the percentage of the people in the village who used the shop for this period.

(*b*) (i) Use the graph to predict the percentage of the people in the village likely to use the shop in the year 2020.

(ii) Is your prediction reliable?
Explain your answer.

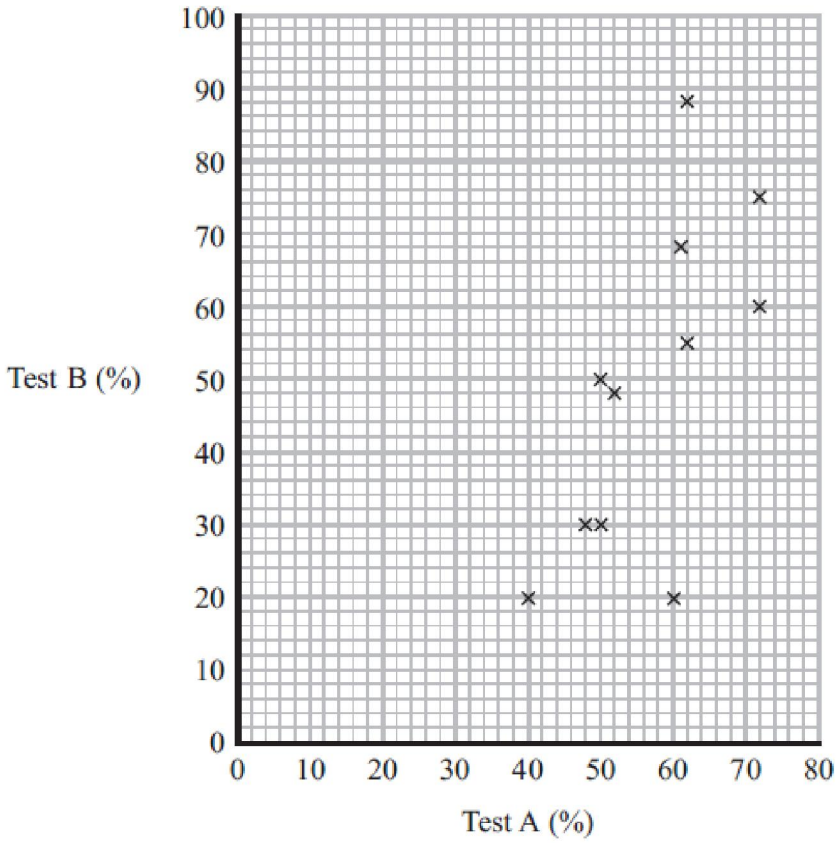
Question 13 (AO2): 28% of students got this right

17. A teacher gives her class two tests.
She records the marks for each test as a percentage.

The scatter graph shows this information.
The teacher has the marks for one more pupil.

This pupil got 76% in test A.
The pupil got 92% in test B.

(a) Show this information on the scatter graph.



(1)

(b) Describe the relationship between the percentage marks in test A and the percentage marks in test B.

.....

.....

(1)

One student missed test B.
This student got 65% in test A.

(c) Estimate this student's percentage for test B.

.....%

(2)

(Total 4 marks)

Question 14 (AO3): 27% of students got this right

21. There are only red pens and blue pens in a box.
There are 12 red pens in the box.

The probability of taking at random a blue pen from the box is $\frac{2}{3}$

Work out the total number of pens in the box.

.....

(Total 3 marks)

Question 15 (AO2): 26% of students got this right

17.

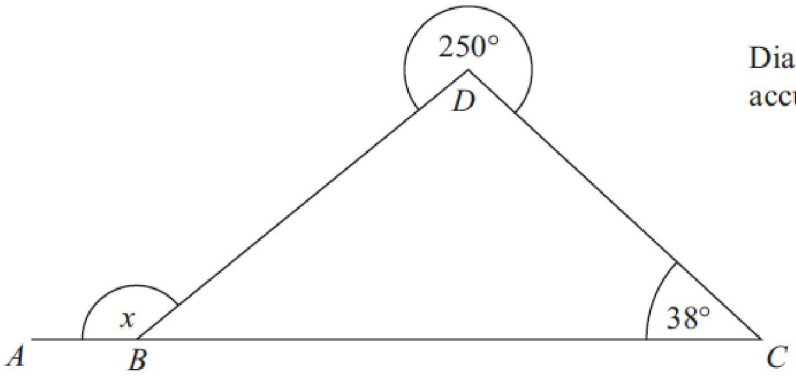


Diagram **NOT** accurately drawn

ABC is a straight line.
Angle *BCD* = 38°
The reflex angle *BCD* = 250°

Work out the size of the angle marked *x*.
Give reasons for your answer.

(Total 4 marks)

Question 16 (AO1): 25% of students got this right

2 Write 56.78 correct to one significant figure.

.....

(Total for Question 2 is 1 mark)

Question 17 (AO1): 23% of students got this right

21. A factory makes metal bottle tops.

When a bottle top is too big or too small it does not fit the bottle.

The probability that a bottle top is too big is 0.008
The probability that a bottle top is too small is 0.015

A bottle top is taken at random.

Work out the probability that the bottle top **does** fit the bottle.

.....

(Total 2 marks)

Question 18 (AO3): 23% of students got this right

19. Ann has some cards.

Beth has 4 cards more than Ann.
Cath has three times as many cards as Beth.
The total number of cards is 51

How many cards does each of the three people have?
You must show all your working.

(Total 5 marks)

Question 19 (AO3): 21% of students got this right

19 There are only blue cubes, yellow cubes and green cubes in a bag.

There are

twice as many blue cubes as yellow cubes
and four times as many green cubes as blue cubes.

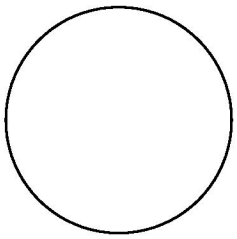
Hannah takes at random a cube from the bag.

Work out the probability that Hannah takes a yellow cube.

Question 20 (AO1): 21% of students got this right

21 Volume of a sphere = $\frac{4}{3}\pi r^3$

A steel sphere, radius 7 cm, is shown.



21 (a) Work out the volume of the sphere.

[2 marks]

21 (b) The density of the steel is 5.6 grams/cm^3
Work out the mass of the sphere.

[2 marks]

Question 21 (AO1): 20% of students got this right

24 (*a*) Solve $2x^2 = 72$

Question 22 (AO2): 19% of students got this right

22. Henry is thinking about having a water meter.

These are the two ways he can pay for the water he uses.

Water Meter

A charge of £28.20 per year

plus

91.22p for every cubic metre of water used

1 cubic metre = 1000 litres

No Water Meter

A charge of £107 per year

Henry uses an average of 180 litres of water each day.

Henry wants to pay as little as possible for the water he uses.
Should Henry have a water meter?

(Total for Question 15 is 5 marks)

Question 23 (AO1): 19% of students got this right

15.

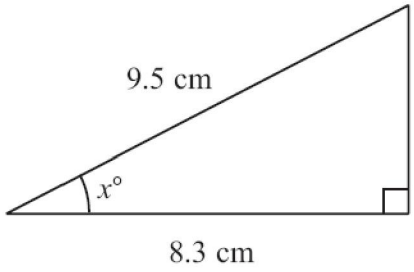


Diagram **NOT** accurately drawn

Work out the value of x.
Give your answer correct to 1 decimal place.

x = ...

(Total 3 marks)

Question 24 (AO1): 18% of students got this right

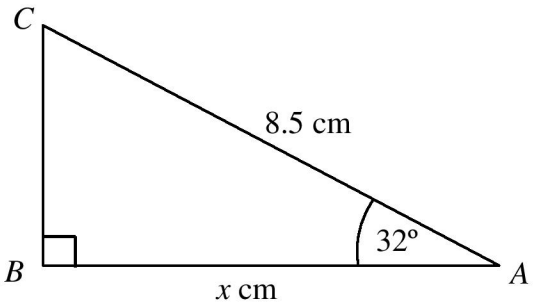
11 (*b*) Make v the subject of the formula $T = 4v + 3$

(2)

(Total for Question 11 is 4 marks)

Question 25 (AO1): 17% of students got this right

22. *ABC* is a right-angled triangle.



Work out the value of x.

Give your answer correct to 1 decimal place.

Question 26 (AO1): 17% of students got this right

8 A road map has a scale of 1 : 10 000
The length of a road on the map is 4.5 cm.

Work out the length of the real road in kilometres.

.....

(Total for Question 8 is 3 marks)

Question 27 (AO1): 16% of students got this right

17. (*b*) Make *a* the subject of the formula $v = u + at$

.....

(2)

(Total 4 marks)

Answers to Qn 1 (AO1): 39% of students got this right

Question		Working	Answer	Mark	Notes
11.	(a)		23	1	B1
	(b)	$(-5-3)\div 4$	-2	2	M1 A1
	(c)		$y = 4x + 3$	2	B2 for $y = 4x + 3$ oe If not B2 then B1 for $4x + 3$ **or** $x = (y - 3) \div 4$

Answers to Qn 2 (AO1): 39% of students got this right

Question		Working	Answer	Mark	Notes
11.			2 minutes 29 seconds	3	M1 for correct method for adding the four times M1 for 20 minutes (or 1200 seconds) – **"total time"** A1 cao **OR** M1 for correct method for subtracting one time from 20 minutes (or 1200 seconds) M1 for subtracting each "time" A1 cao

Answers to Qn 3 (AO1): 37% of students got this right

Question		Working	Answer	Mark	Notes
18	(b)		20	2	M1 for 0.1×200 oe A1 cao SC : If M0 then award B1 for an answer of $\frac{20}{200}$

Answers to Qn 4 (AO2): 36% of students got this right

Paper 1MA1: 3F			
Question	**Working**	**Answer**	**Notes**
19	3.69 × 2 = 7.38	19	P1 for 7.38 repeatedly added at least 6 times OR 50 ÷ 7.38 P1 for 6 × 7.38 + 3.69 A1 19 boxes

Answers to Qn 5 (AO1): 35% of students got this right

12 Work out the value of $\frac{\sqrt{5.5}+1.5}{3.25}$

Give your answer correct to 2 decimal places.

$\sqrt{5.5} = 2.34520\ldots$

$\sqrt{5.5} + 1.5 = 3.84520\ldots$

$\frac{3.84520}{3.25} = 1.183140886\ldots$

Answers to Qn 6 (AO1): 34% of students got this right

Question		Working	Answer	Mark	Notes
13	(b)		Polygon	2	B2 for fully correct frequency polygon - points plotted at the midpoint (B1 for all points plotted accurately but not joined with straight line segments **or** all points plotted accurately and joined with last joined to first to make a polygon **or** all points at the correct heights and consistently within or at the ends of the intervals **and** joined (can include joining last to first to make a polygon)

Answers to Qn 7 (AO1): 33% of students got this right

Question 11 (Total 4 marks)

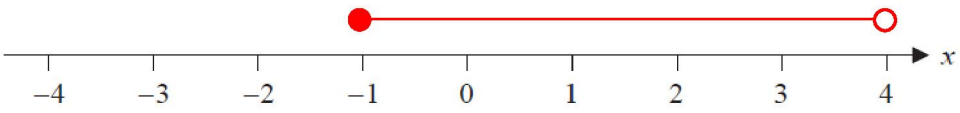
Part	Working an or answer examiner might expect to see	Mark	Notes
(b)	6 feet 3 inches = (6 × 12) + 3 = 75 inches	M1	This mark is given for finding 6 ft 3 inches in inches
	25 inches = 63 cm	M1	This mark is given for finding a method to convert to cm
	75 inches = 189 cm	A1	This mark is given for an answer in the range 186 to 195

Answers to Qn 8 (AO3): 32% of students got this right

Question		Working	Answer	Mark	Notes
14.			4.20	4	M1 for 30 ÷ (2 + 1) (=10) M1 for "10" × 2 × 2.8 (=56) oe M1 for (98 – "56") ÷ "10" A1 cao 4.2(0) **OR** algebraic approach M1 for (eg) $c=2a$ and $c+a=30$ M1 for (eg) $2.8\ c+wa=98$ M1 for (w =) (98 – "56") ÷ "10" A1 cao 4.2(0)

Answers to Qn 9 (AO1): 30% of students got this right

22a Here is a number line.



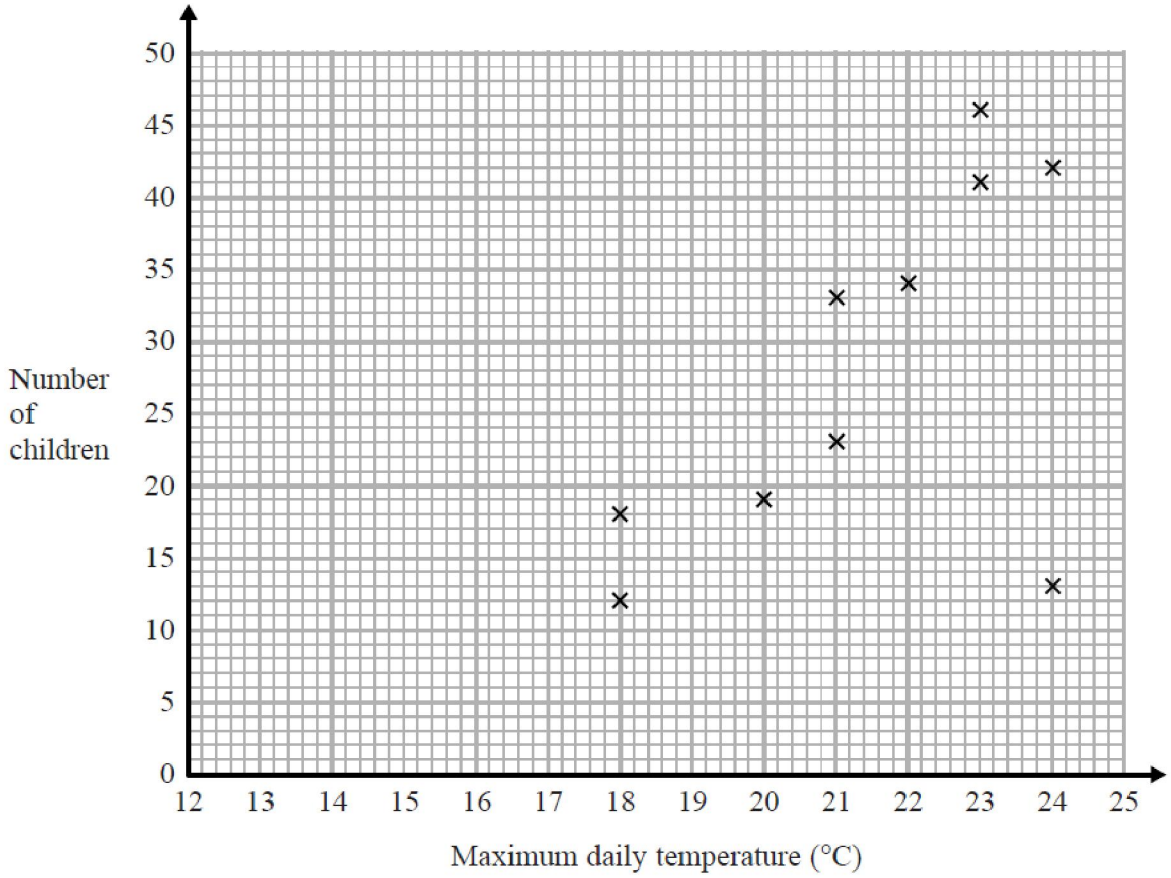
(a) On this number line, show the inequality $-1 \leq x < 4$

Answers to Qn 10 (AO1): 29% of students got this right

17.	(*a*)	$x^2 + 9x - 3x - 27$	$x^2 + 6x - 27$	2	M1 for 3 out of 4 terms correct or 4 terms correct ignoring signs A1

Answers to Qn 11 (AO1): 29% of students got this right

25a Jean records the maximum daily temperature each day for 10 days.
She also records the number of children going to a paddling pool for each of these days.
She draws this scatter graph for her information.



Jean's information for one of these days is an outlier on the scatter graph.

(a) Give a possible reason for this.

e.g. Rain, school day, measurement error

Answers to Qn 12 (AO2): 28% of students got this right

Paper 1MA1: 2F			
Question	**Working**	**Answer**	**Notes**
23 (a)		Trend described	C1 for "percentage of people who use the shop decreases" oe
(bi)		13 - 17	P1 for process to draw trend line on graph A1 for 13 - 17
(bii)		No + reason	C1 for comment, eg "no, because 2020 is beyond the time period covered by the given data"

Answers to Qn 13 (AO2): 28% of students got this right

Question		Working	Answer	Mark	Notes
17.	(a)		Point at (76, 92)	1	B1 point plotted ±0.5 small square
	(b)		Relationship described	1	B1 for a description of dynamic relationship, e.g the greater the score in test A the greater the score in test B or positive correlation (B0 If contradiction is made)
	(c)		Line of best fit	2	M1 for an appropriate line of best fit or a vertical line drawn at 65 or a point plotted at (65, answer) A1 for an answer in the range 60–70 inclusive

Answers to Qn 14 (AO3): 27% of students got this right

	21.	12 are red. $\frac{1}{3}$ are red $12 \times 3 =$ 2 blue for 1 red 24 blue for 12 red $24 + 12 =$	36	3	M1 for P(red) = $\frac{1}{3}$ M1 for $\frac{1}{3} \times 36 = 12$ red or 12×3 A1 for 36 cao OR M1 for 2 blue for 1 red M1 for 24 blue for 12 red or $24 + 12$ A1 for 36 cao

Answers to Qn 15 (AO2): 26% of students got this right

17.			148°	4	M1 for (angle *BDC* =) 360 – 250 (=110) M1 (dep) for 180 – (180 – '110' – 38) (= 148) or for '110' + 38 (= 148) C2 (dep on M2) for $x = 148$ with full reasons, relevant to the complete correct method used, for example: Angles at a point add up to 360° **and** angles in a triangle add up to 180° **and** angles on a straight line add up to 180°; Or Angles at a point add up to 360° **and** exterior angle of a triangle is equal to the sum of the interior opposite angles or (C1 (dep on at least M1) for one reason relevant to correct method)

Answers to Qn 16 (AO1): 25% of students got this right

Question 2 (Total 1 mark)

Part	Working an or answer examiner might expect to see	Mark	Notes
	60	B1	This mark is given for the correct answer only

Answers to Qn 17 (AO1): 23% of students got this right

Question		Working	Answer	Mark	Notes
21		1 – (0.008 + 0.015)	0.977	2	M1 for 1 – (0.008 + 0.015) oe A1 for 0.977 oe

Answers to Qn 18 (AO3): 23% of students got this right

Question		Working	Answer	Mark	Notes
19		$x + x + 4 + 3(x + 4) = 51$ $2x + 4 + 3x + 12 = 51$ $5x + 16 = 51$ $5x = 35$ $5x = 35 \div 5$	Ann 7 Beth 11 Cath 33	5	M1 for $x + 4$ or $3(x + 4)$ oe seen M1 for x + '$x + 4$' + '$3(x + 4)$' M1 x + '$x + 4$' + '$3(x + 4)$' = 51 A1 for 7 or 11 or 33 C1 for Ann 7, Beth 11, and Cath 33 oe **OR** M1 for using a value for n, eg $n + 4$ or $4 \times n$ M1 for attempting a trial using n, $n + 4$ and $3(n + 4)$ M1 for at least 2 trials with correct totals for 'n' A1 for 11 or 33 C1 for Ann 7, Beth 11, and Cath 33 oe

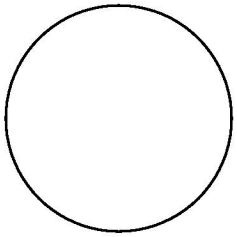
Answers to Qn 19 (AO3): 21% of students got this right

Part	Working or answer an examiner might expect to see	Mark	Notes
19	B : Y = 2 : 1	1	This mark is given for a correct ratio for the blue and yellow cubes
	B : Y : G = 2 : 1 : 8	1	This mark is given for a correct ratio for the blue, yellow and green cubes
	$\frac{1}{2+1+8} = \frac{1}{11}$	1	This mark is given for the answer shown or an equivalent fraction

Answers to Qn 20 (AO1): 21% of students got this right

21 Volume of a sphere = $\frac{4}{3}\pi r^3$

A steel sphere, radius 7 cm, is shown.



21 (a) Work out the volume of the sphere.

[2 marks]

$\frac{4}{3} \times \pi \times 7^3$

Answer 1436.76 cm^3

21 (b) The density of the steel is 5.6 grams/cm^3
Work out the mass of the sphere.

[2 marks]

1436.76.. × 5.6

Answer 8045.83 or $\frac{38416}{15}\pi$ grams

Answers to Qn 21 (AO1): 20% of students got this right

Part	Working or answer an examiner might expect to see	Mark	Notes
24 (a)	$2x^2 = 72$, $x^2 = 36$ $x = \sqrt{36}$ +6, –6	2	These marks are given for a pair of solutions (One mark is given for either +6 or –6)

Answers to Qn 22 (AO2): 19% of students got this right

	22.	180 × 365 = 65700 65700 ÷1000 = 65.7 65.7 × 91.22 = 5993.154 5993.154÷100 + 28.20 = 88.13... D U C T 366 65880 6010 88.30 365 65700 5993 88.13 65000 5929 87.49 66000 6020 88.40 364 65520 5976 87.96 360 64800 5911 87.31 ~~336~~ ~~60480~~ 5517 83.37	Decision (should have a water meter installed)	5	**Per year** M1 for 180 × '365' (= 65700) M1 for '65700' ÷ 1000 (= 65.7 or 65 or 66) M1 for '65.7' × 91.22 (= 5993...) A1 for answer in range (£)87 to (£)89 C1 (dep on at least M1) for conclusion following from working seen **OR (per day)** M1 for 107 ÷ '365' (= 0.293…) M1 for 180 ÷ 1000 × 91.22 (= 16.4196) M1 for 28.2 ÷ '365' + '0.164196' (units must be consistent) A1 for 29 – 30(p) and 24 – 24.3(p) (or equivalent) C1 (dep on at least M1) for conclusion following from working seen **OR** M1 for (107 – 28.20) ÷ 0.9122 (= 86.384..) M1 for '86.384..'× 1000 (= 86384.5…) M1 for '365' × 180 (= 65700) A1 for 65700 and 86384.5... C1 (dep on at least M1) for conclusion following from working seen NB : Allow 365 or 366 or 52×7 (=364) or 12 × 30 (=360) or 365¼ for number of days

Answers to Qn 23 (AO1): 19% of students got this right

15.			29.1	3	M1 use of cos M1 cos ("x") = (= 0.87…) or ("x" =) cos – 1 ( ) **OR** or M2 for sin and following correct Pythagoras or M2 for tan and following correct Pythagoras or correct Pythagoras and then correct use of sine or cosine rule with "21.36" A1 for ans rounding to 29.1 (29.1103…)

Answers to Qn 24 (AO1): 18% of students got this right

Paper: 1MA1/3F				
Question	**Working**	**Answer**	**Mark**	**Notes**
11 (b)		$v = \frac{T-3}{4}$	M1 A1	correct first step to rearrange by isolating $4v$ or dividing each term by 4, eg $T - 3 = 4v$ fully correct answer

Answers to Qn 25 (AO1): 17% of students got this right

Question		Working	Answer	Mark	Notes
22			7.2	2	M1 starts process, e.g. $\cos 32° = \frac{x}{8.5}$ A1 for answer in range 7.2 to 7.21

Answers to Qn 26 (AO1): 17% of students got this right

8 A road map has a scale of 1 : 10 000
The length of a road on the map is 4.5 cm.

Work out the length of the real road in kilometres.

4.5 × 10,000 = 45,000cm

45,000 ÷ 100 = 450m

450 ÷ 1000 = 0.45km

Answers to Qn 27 (AO1): 16% of students got this right

17	(b)	$v - u = at$	$a = \frac{v-u}{t}$ oe	2	M1 A1