PINPOINT REVISION PACKS

38_to_61_Percent_Pinpoint_AI_Pack

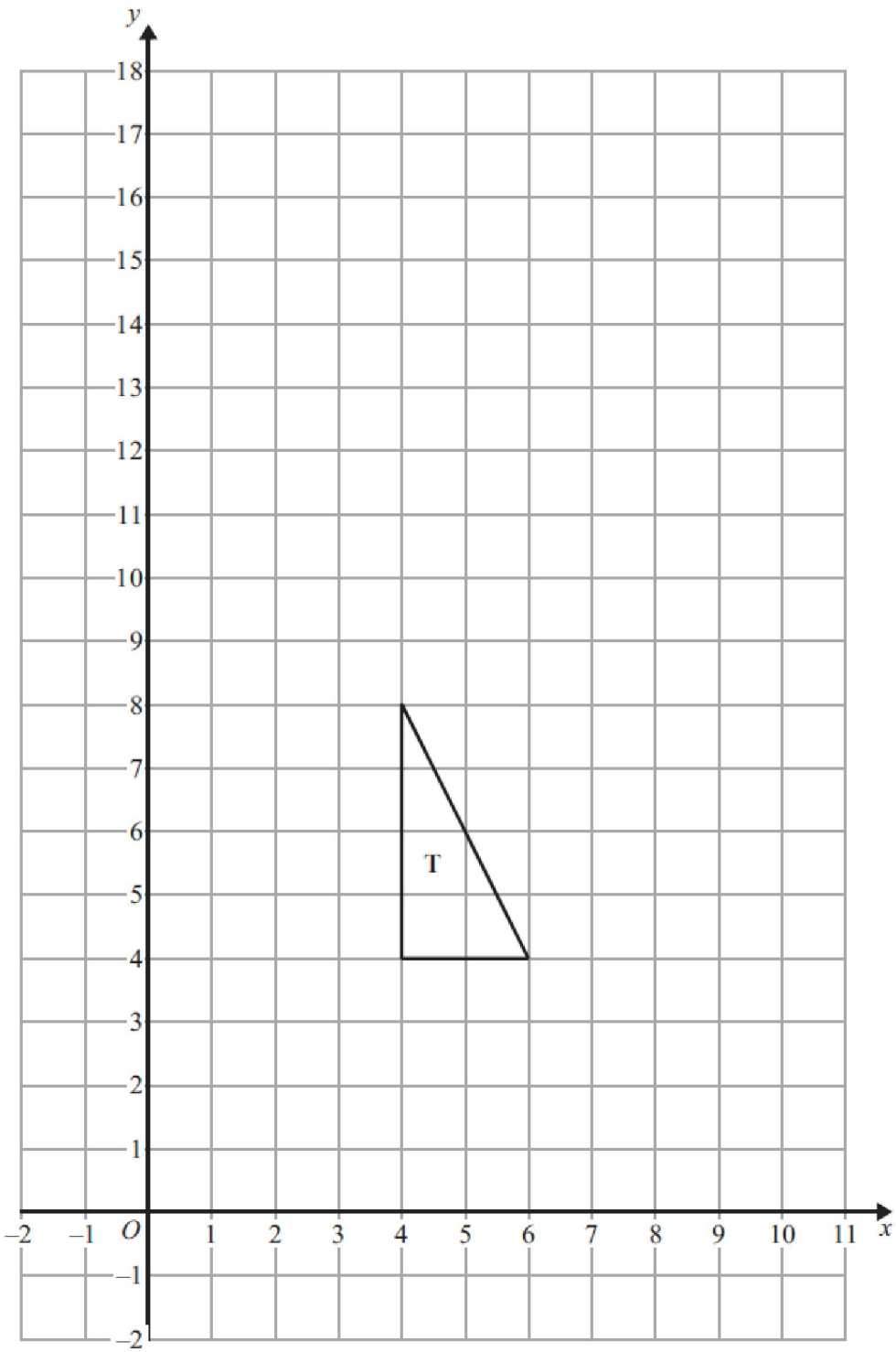
Time Allocation = 86mins , Max = 76 Marks

Calculated Grade Boundaries:

Grade	Marks
4-	11
4	22
4+	33
5-	44
5	55
5+	66
6-	76

Question 1 (AO1): (No Calc) 59% of students got this right (3 marks)

10.



Enlarge triangle **T** by a scale factor $\frac{1}{2}$, centre (2, 0).

(Total 3 marks)

Question 2 (AO1): (No Calc) 59% of students got this right (3 marks)

8. $-6 \leq 2y < 5$

y is an integer.

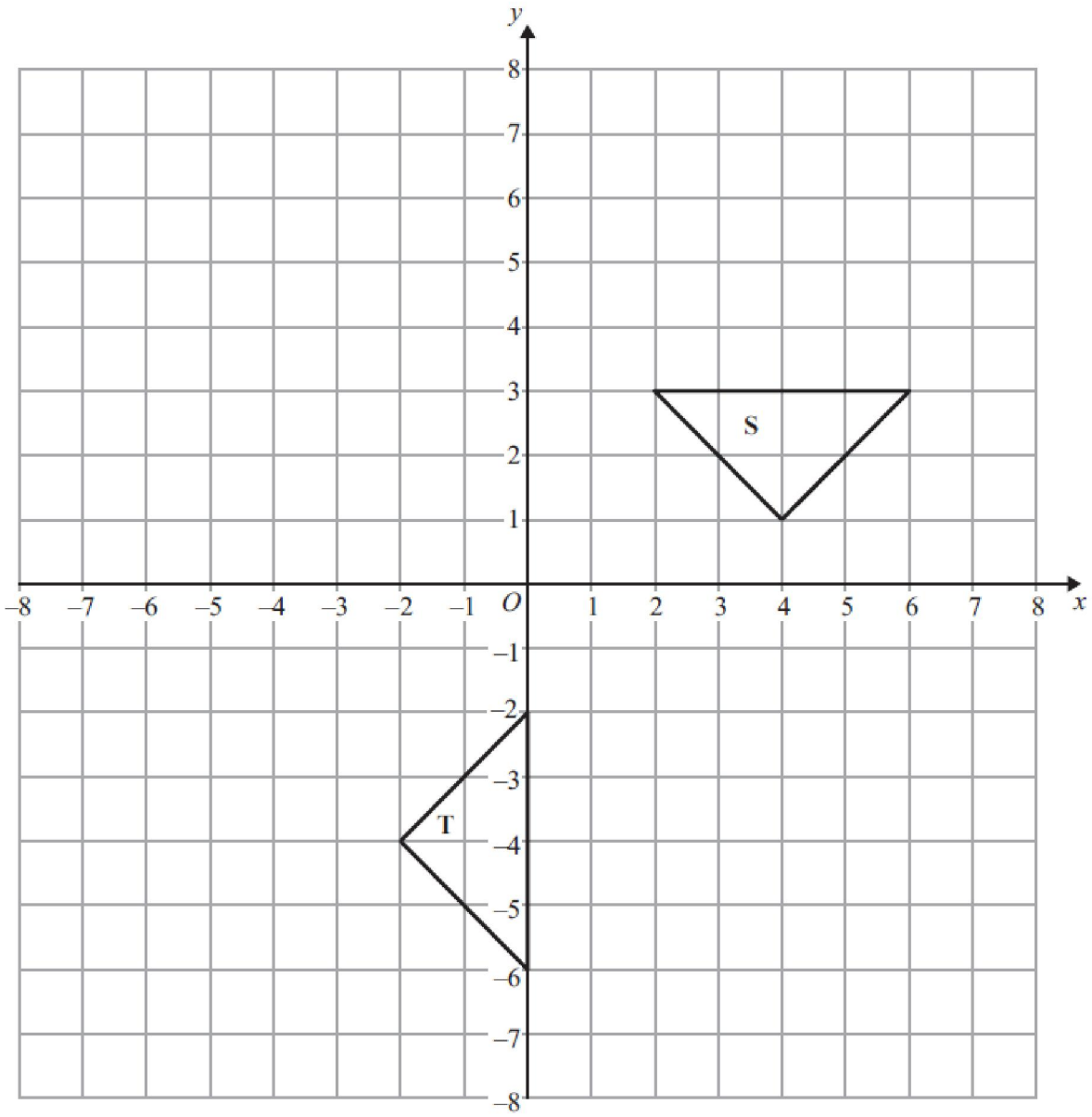
Write down all the possible values of y.

.....

(Total 3 marks)

Question 3 (AO2): 57% of students got this right (3 marks)

10.



Shape **S** can be transformed to shape **T** by the translation $\begin{pmatrix} 0 \\ -3 \end{pmatrix}$ followed by a rotation.

(c) Describe the rotation.

.....

.....

.....

.....

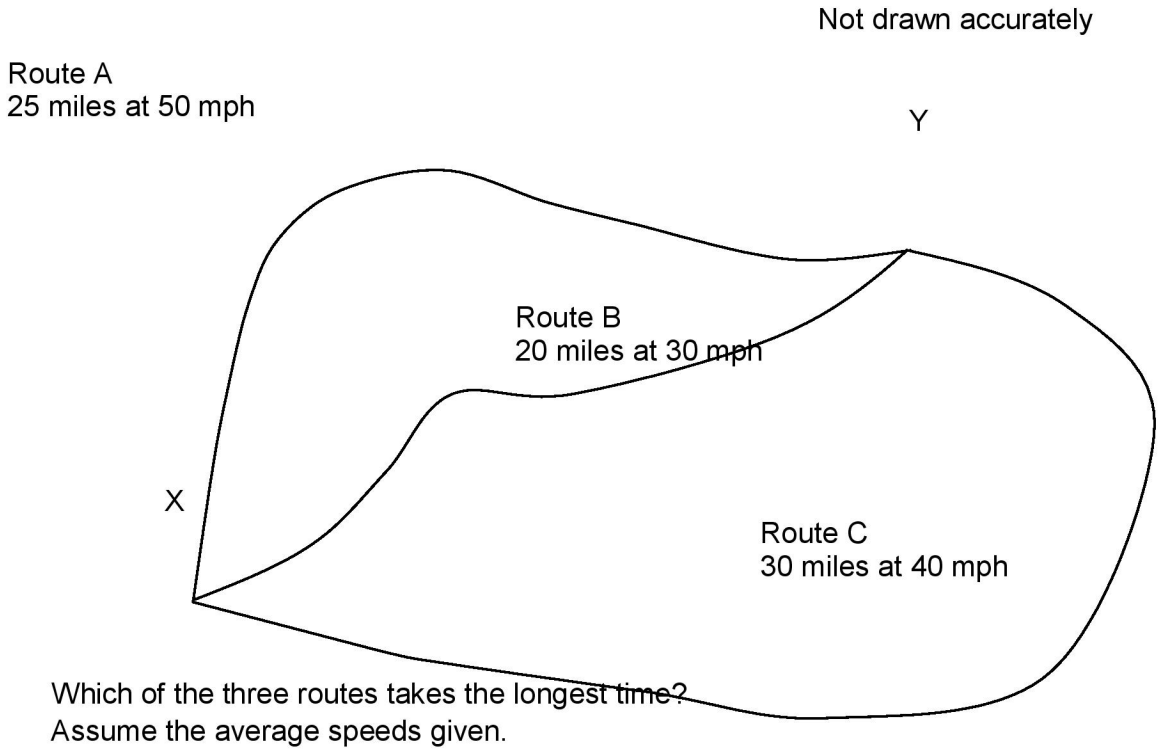
(3)

(Total 7 marks)

Question 4 (AO3): (No Calc) 54% of students got this right (7 marks)

10 The diagram shows three routes, A, B and C, between two towns, X and Y.

The distance and average speed for each route is shown.



10 (a) Which of the three routes takes the longest time?
Assume the average speeds given.

You **must** show your working.

[4 marks]

Answer _____

10 (b) Jon and Matt take the same time to travel from X to Y.

Jon travels along route B at 10 mph **faster** than the average speed.

Matt travels along route C.

Does Matt travel faster or slower than the average speed for route C, and by how much?

You **must** show your working.

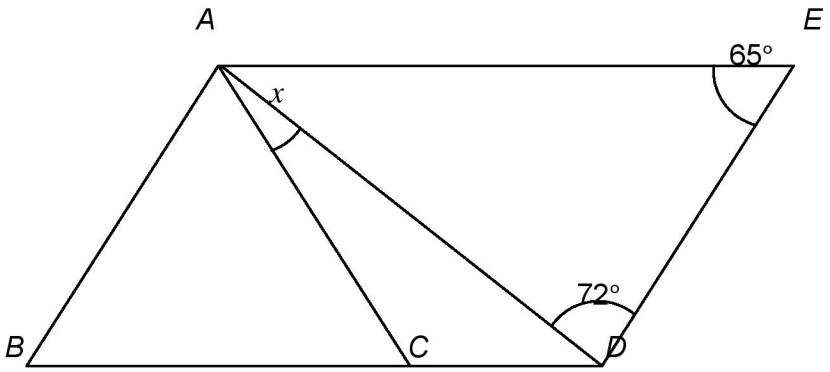
[3 marks]

Question 5 (AO2): (No Calc) 53% of students got this right (3 marks)

7 *ABDE* is a parallelogram.

$AB = AC$

Not drawn accurately

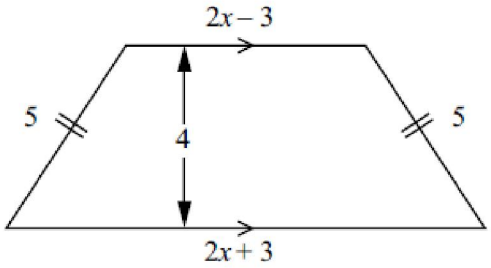


Show that $x = 22°$

[3 marks]

Question 6 (AO3): 52% of students got this right (6 marks)

4. Here is a trapezium.



All the measurements are in cm.
The area of the trapezium is 18 cm².

Calculate the numerical value of the perimeter of the trapezium.

.....cm

(Total 6 marks)

Question 7 (AO3): (No Calc) 51% of students got this right (4 marks)

17 Naz buys a fridge from a shop for £189

The cost of delivery is proportional to the distance from the shop.

For 15 miles, the cost is £9

Naz lives 24 miles from the shop.
Is the total cost **more** than £200?

You **must** show your working.

[4 marks]

Answer _____

Question 8 (AO1): (No Calc) 51% of students got this right (5 marks)

10.

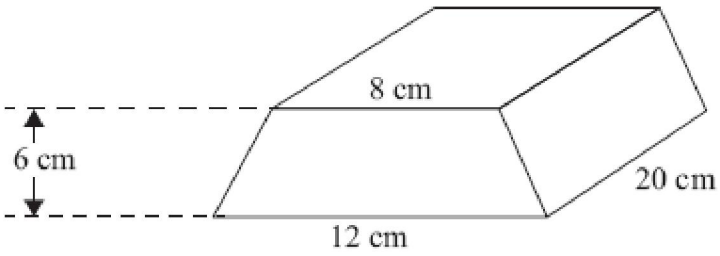


Diagram **NOT** accurately drawn

The diagram shows a solid prism made from metal.
The cross-section of the prism is a trapezium.

The parallel sides of the trapezium are 8 cm and 12 cm.
The height of the trapezium is 6 cm.
The length of the prism is 20 cm.

The density of the metal is 5 g/cm^3.

Calculate the mass of the prism.
Give your answer in kilograms.

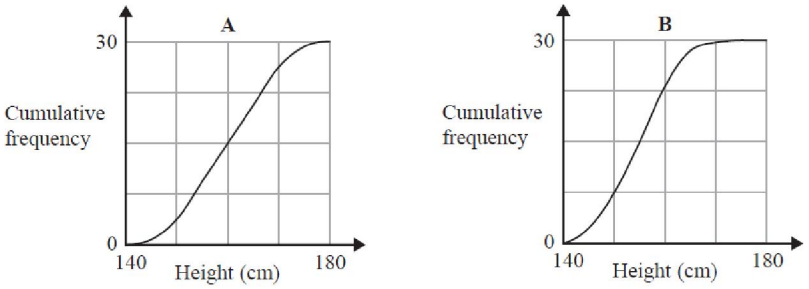
..... kg

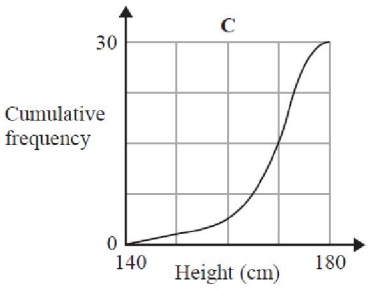
(Total 5 marks)

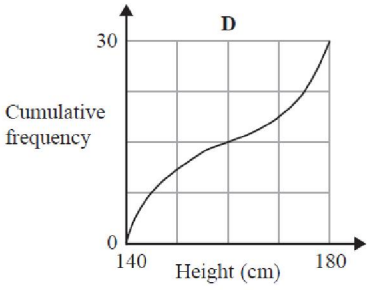
Question 9 (AO3): (No Calc) 50% of students got this right (2 marks)

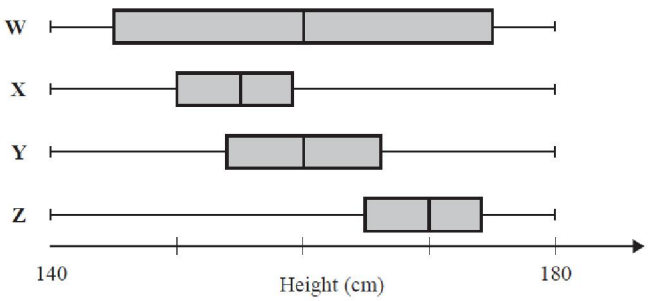
11 Gill measured the heights of children from four separate classes.

She drew a cumulative frequency graph and a box plot for each class.









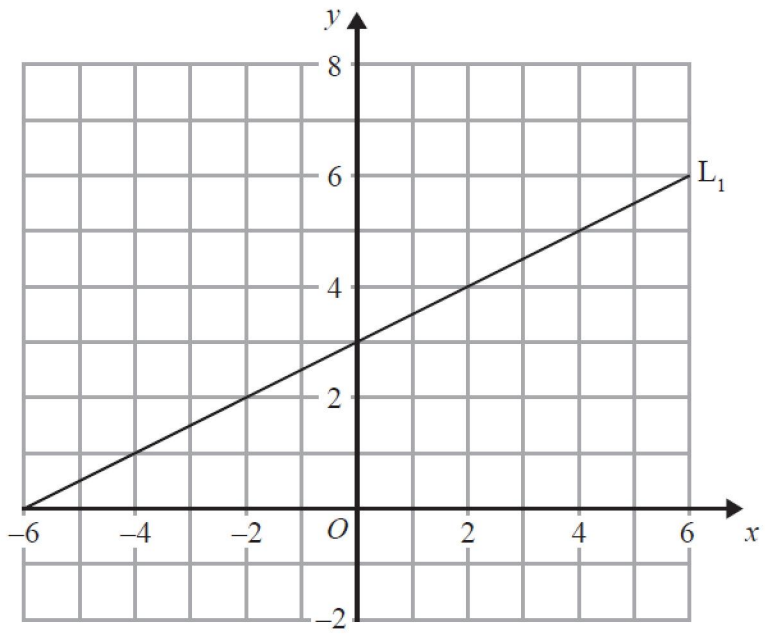
Match each cumulative frequency graph to its box plot.

Cumulative frequency graph	Box plot
A	
B	
C	
D	

(Total for Question 11 is 2 marks)

Question 10 (AO1): 49% of students got this right (3 marks)

8. The diagram shows a straight line, L_1, drawn on a grid.



A straight line, L_2, is parallel to the straight line L_1 and passes through the point (0, –5).

Find an equation of the straight line L_2.

.....

(Total 3 marks)

Question 11 (AO1): (No Calc) 47% of students got this right (3 marks)

7 Work out an estimate for the value of $\dfrac{\sqrt{4.93\times17.1}}{0.209}$

.....

(Total for Question 7 is 3 marks)

Question 12 (AO3): (No Calc) 45% of students got this right (5 marks)

8 (a) Here are the fourth and fifth terms of a Fibonacci-type sequence.

____ ____ ____ 28 43

Each term is the sum of the previous two terms.
Show that the first term is 2

[2 marks]

8 (b) Here are the first and third terms of a different Fibonacci-type sequence.

a ____ b ____ ____

Each term is the sum of the previous two terms.
Work out an expression in terms of a and b for the fifth term.

[3 marks]

Answer _____

Question 13 (AO1): (No Calc) 45% of students got this right (3 marks)

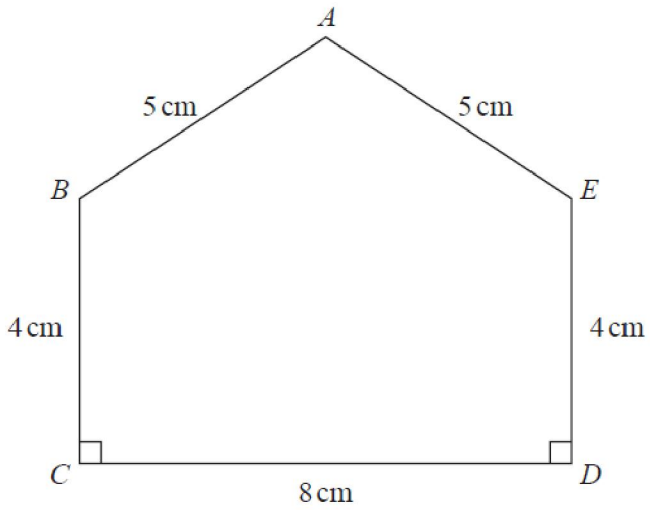
13. Simplify fully $\dfrac{2x^2 - 7x + 3}{x^2 - 9}$

.....

(Total 3 marks)

Question 14 (AO3): (No Calc) 44% of students got this right (5 marks)

3 *ABCDE* is a pentagon.



Work out the area of *ABCDE*.

..... cm^2

(Total for Question 3 is 5 marks)

Question 15 (AO1): (No Calc) 43% of students got this right (5 marks)

11. (*a*) Write down the value of 25^0

.....

(1)

(*b*) Write down the value of $49^{-\frac{1}{2}}$

.....

(1)

(*c*) Write as a power of 2 $\dfrac{4\times 8}{16^3}$

.....

(3)

(Total 5 marks)

Question 16 (AO1): (No Calc) 42% of students got this right (3 marks)

19 (a) Work out the value of $\sqrt{2}^4$

[1 mark]

Answer _____

19 (b) Expand and simplify $(\sqrt{2} + 3)^2$

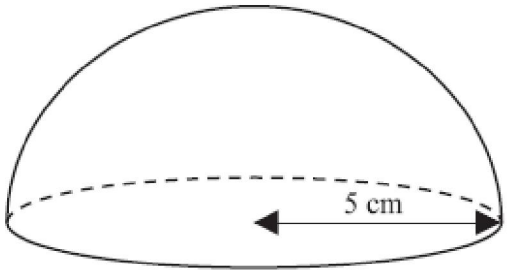
[2 marks]

Answer _____

Question 17 (AO1): (No Calc) 41% of students got this right (3 marks)

13. The diagram shows a solid hemisphere of radius 5 cm.

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



Find the **total** surface area of the solid hemisphere.
Give your answer in terms of π.

..... cm^2

(Total 3 marks)

Question 18 (AO1): (No Calc) 40% of students got this right (1 marks)

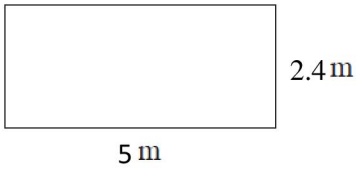
15 Circle the expression that is equivalent to $\frac{2x^2+1}{x}$ where x is not equal to 0

[1 mark]

$2x + 1$ $2x^2 + \frac{1}{2}$ $2x + \frac{1}{x}$ $4x + \frac{1}{x}$

Question 19 (AO3): (No Calc) 40% of students got this right (5 marks)

5a The diagram shows a rectangular floor.



Felix is going to cover the floor with rectangular tiles.
Each tile is 50 cm by 40 cm.
$\frac{1}{6}$ of the tiles will be orange.
Some of the tiles will be purple.
The rest of the tiles will be red.

The ratio of the number of purple tiles to the number of red tiles will be 1 : 4

(a) Assuming there are no gaps between the tiles, how many tiles of each colour will Felix need?

orange tiles .....

purple tiles .....

red tiles .....

(5)

Question 20 (AO3): (No Calc) 40% of students got this right (4 marks)

14. There are 20 counters in a bag.

8 of the counters are yellow.
12 of the counters are green.

Asif takes at random two of the counters.

Work out the probability that the two counters are different colours.

.....

(Total 4 marks)

Ext Qn1 (AO1): (No Calc) Only 32% of students got this right(4 mark

***21**

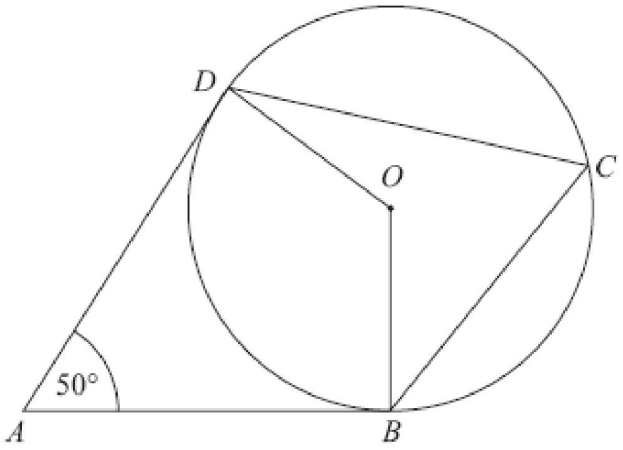


Diagram **NOT** accurately drawn

B, *C* and *D* are points on the circumference of a circle, centre *O*.
AB and *AD* are tangents to the circle.

Angle *DAB* = 50°

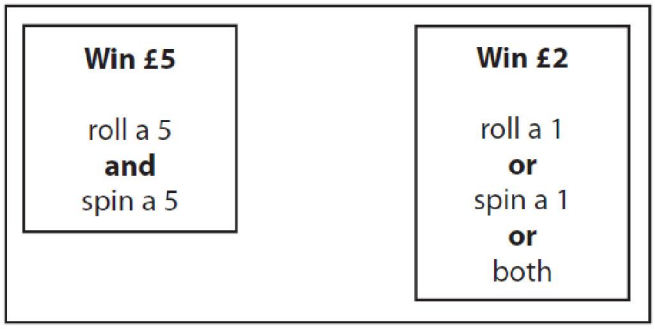
Work out the size of angle *BCD*.
Give a reason for each stage in your working.

(Total for Question 21 is 4 marks)

Ext Qn2 (AO1): (No Calc) Only 32% of students got this right(5 mark

3 David has designed a game.
He uses a fair 6-sided dice and a fair 5-sided spinner.
The dice is numbered 1 to 6.
The spinner is numbered 1 to 5.

Each player rolls the dice once and spins the spinner once.
A player can win £5 or win £2.



David expects 30 people will play his game.
Each person will pay David £1 to play the game.

(*a*) Work out how much profit David can expect to make.

(*b*) Give a reason why David's actual profit may be different to the profit he expects to make.

Ext Qn3 (AO2): Only 32% of students got this right(3 marks)

12. (b) Write $\frac{4}{x+2} + \frac{3}{x-2}$ as a single fraction in its simplest form.

.....

(3)

Answers to Qn 1 (AO1): (No Calc) 59% of students got this right

10.			Vertices at (3, 2), (3, 4) and (4, 2)	3	M1 for centre (2, 0) marked M1 for all sides × ½ A1 cao SC B2 for correct enlargement from (2, 0), scale factor $\neq 0.5$ or for correct enlargement from (0, 2), scale factor = 0.5

Answers to Qn 2 (AO1): (No Calc) 59% of students got this right

8.		$-3 \leq y < 2.5$	$-3, -2, -1, 0, 1, 2$	3	M1 for dividing a list of integers by 2 or for $y \geq -3$ and/or $y < \frac{5}{2}$ seen or implied A2 for all integers correct (A1 for 5 correct with no more than one extra)

Answers to Qn 3 (AO2): 57% of students got this right

Question		Working	Answer	Mark	Notes
10.	(c)		90° clockwise, centre (0, 0)	3	B2 90° clockwise or 270° anticlockwise (B1 90° or 270° stated without direction or with incorrect direction or correct translation of S shown) B1 centre (0,0)

Answers to Qn 4 (AO3): (No Calc) 54% of students got this right

10(a)	**Alternative method 1**		
	25 ÷ 50 (60) or 30 minutes or $\frac{1}{2}$ h or 20 ÷ 30 (60) or 40 minutes or $\frac{2}{3}$ h or 30 ÷ 40 (60) or 45 minutes or $\frac{3}{4}$ h	M1	oe
	Two of 25 ÷ 50 (60) or 30 minutes or $\frac{1}{2}$ h and 20 ÷ 30 (60) or 40 minutes or $\frac{2}{3}$ h and 30 ÷ 40 (60) or 45 minutes or $\frac{3}{4}$ h	M1	oe
	25 ÷ 50 (60) or 30 minutes or $\frac{1}{2}$ h and 20 ÷ 30 (60) or 40 minutes or $\frac{2}{3}$ h and 30 ÷ 40 (60) or 45 minutes or $\frac{3}{4}$ h	M1	oe
	C with all working correct	A1	oe

10(b)	time = 30 minutes or $\frac{1}{2}$ h or 15 minutes difference or scale factor 2	B1	oe
	30 2 or 30 ÷ $\frac{1}{2}$ or 60	M1	
	20 mph faster	A1	
	Additional Guidance		
	20 mph with no box ticked		B1M1A0
	20 mph with slower ticked		B1M1A0

Answers to Qn 5 (AO2): (No Calc) 53% of students got this right

7	*DAE* = 180 − 65 − 72 or 43 or *ABC* = 65 or *DAB* = 72 or *EDB* = 180 − 65 or 115 or *BAE* = 180 − 65 or 115	M1	May be on diagram in correct position
	BAC = 180 − 65 − 65 or 50 or *ADB* = 115 − 72 or 43 and *ACD* = 115 or *BAC* = 50, *BAE* = 115 and *ADB* = 115 − 72 or 43 or *CAE* = 65 and *DAE* = 43 or *DAB* = 72 and *BAC* = 50	M1	May be on diagram in correct position oe
	72 – 50 = 22 or 180 − 115 − 43 = 22 or 115 − 50 − 43 = 22 or 65 − 43 = 22	A1	
	Additional Guidance		
	eg 115 or *A* = 50 is ambiguous Written work takes precedence over diagrams if contradictory.		M0

Answers to Qn 6 (AO3): 52% of students got this right

Question		Working	Answer	Mark	Notes
4.		$(2x - 3 + 2x + 3) \div 2 \times 4 = 18$ $8x = 18$ $x = 2.25$ $P = 2x - 3 + 2x + 3 + 5 + 5$ $P = 4x + 10$ $P = 9 + 10$	19 cm	6	M1 for $(2x - 3 + 2x + 3) \div 2 \times 4$ oe M1 for equating "$(2x - 3 + 2x + 3) \div 2 \times 4$" = 18 A1 cao $x = 2.25$ oe (eg. $\frac{18}{8}$) M1 (indep) $2x - 3 + 2x + 3 + 5 + 5$ (= 4x + 10) oe M1 (dep) for substituting "x" into an expression for the perimeter A1 cao

Answers to Qn 7 (AO3): (No Calc) 51% of students got this right

Q	Answer	Mark	Comments
17	**Alternative method 1**		
	$\frac{9}{15}$ or 0.6 or $\frac{24}{15}$ or 1.6	M1	oe
	$\frac{9}{15}$ 24 or $\frac{24}{15}$ 9 or 14.4(0)	M1dep	oe
	their 14.4(0) + 189 or 203.4(0)	M1	11 - 189
	203.4(0) and Yes	A1	11 and 14.4(0) and Yes or (11 ÷ $\frac{9}{15}$ =) 18.3(3...) and Yes
	Alternative method 2		
	200 – 189 or 11	M1	
	$\frac{9}{15}$ or 0.6 or $\frac{24}{15}$ or 1.6	M1	oe
	$\frac{9}{15}$ 24 or $\frac{24}{15}$ 9 or 14.4(0) or 11 ÷ $\frac{9}{15}$ or 18.3(3…)	M1dep	oe
	11 and 14.4(0) and Yes or 18.3(3…) and Yes	A1	
	Additional Guidance		

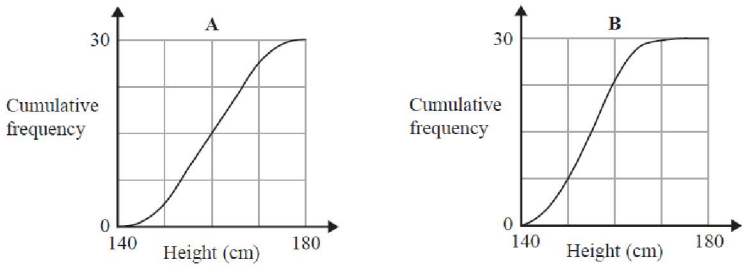
Answers to Qn 8 (AO1): (No Calc) 51% of students got this right

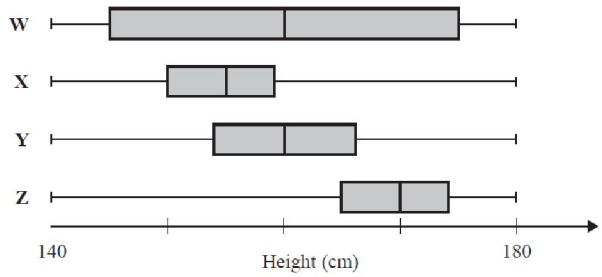
10.		½ (12 + 8) × 6 = 60 '60' × 20 = 1200 1200 × 5 = 6000 6000 ÷ 1000 = 6	6	5	M1 ½ (12 + 8) × 6 oe or 60 seen M1 (dep) '60' × 20 M1 (indep) '1200' × 5 A1 6000 cao A1 ft (dep on 1st or 3rd M1 scored) for 6

Answers to Qn 9 (AO3): (No Calc) 50% of students got this right

11 Joan measured the heights of students in four different classes.

She drew a cumulative frequency graph and a box plot for each class.





Match each cumulative frequency graph to its box plot.

Cumulative frequency graph	Box plot
A	W
B	Y
C	Z
D	X

(Total for Question 11 is 2 marks)

Answers to Qn 10 (AO1): 49% of students got this right

Question		Working	Answer	Mark	Notes
8.			$y = \frac{1}{2}x - 5$	3	M1 for method to find gradient of L_1 e.g $\frac{6-3}{6-0}\left(=\frac{1}{2}\right)$ M1 for $y =$ "$\frac{1}{2}$"$x + c$ or $y = mx - 5$ (c, m do not have to be numerical, or correct numerical values) or for $(L=)\frac{1}{2}x-5$ A1 $y = \frac{1}{2}x - 5$ oe

Answers to Qn 11 (AO1): (No Calc) 47% of students got this right

7 Work out an estimate for the value of $\dfrac{\sqrt{4.93\times17.1}}{0.209}$

$$\frac{\sqrt{5\times20}}{0.2} = \frac{\sqrt{100}}{0.2} = \frac{10}{0.2}$$

$$= \frac{50}{1} = 50$$

..... 50 .....

(Total for Question 7 is 3 marks)

Answers to Qn 12 (AO3): (No Calc) 45% of students got this right

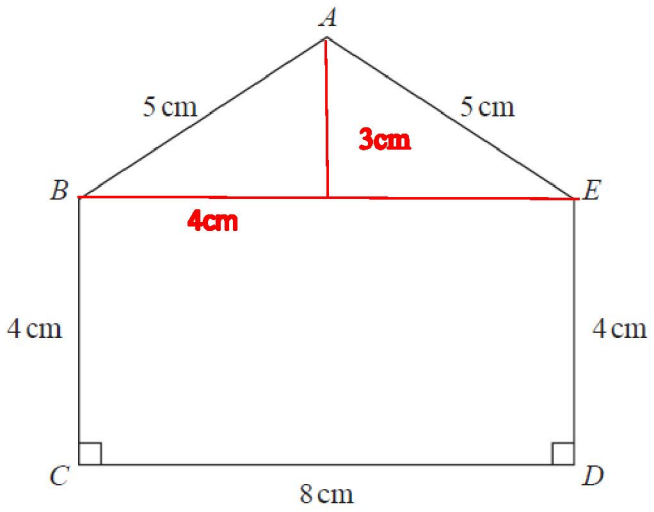
Q	Answer	Mark	Comments
8(a)	**Alternative method 1**		
	43 – 28 or 15 seen	M1	
	15 – 13 (= 2) or 2, 13 and 15	A1	
	Alternative method 2		
	$x + 2y = 28$ and $2x + 3y = 43$	M1	oe equations
	Solves equations correctly obtaining $x = 2$	A1	
	Additional Guidance		
	If setting up two equations, they must be correct		
8(b)	$b - a$	M1	Second term
	$2b - a$	M1dep	oe Fourth term
	$3b - a$	A1	
	Additional Guidance		

Answers to Qn 13 (AO1): (No Calc) 45% of students got this right

13.		$\frac{(2x-1)(x-3)}{(x+3)(x-3)}$	$\frac{(2x-1)}{(x+3)}$	3	M1 for $(2x-1)(x-3)$ M1 for $(x+3)(x-3)$ A1 cao

Answers to Qn 14 (AO3): (No Calc) 44% of students got this right

3 *ABCDE* is a pentagon.



Work out the area of *ABCDE*.

Triangle height = $\sqrt{5^2 - 4^2} = \sqrt{9} = 3cm$

Area of triangle = $\frac{8 \times 3}{2} = 12cm^2$

Area of rectangle = $4 \times 8 = 32cm^2$

Total area = $32 + 12 = 44\ cm^2$

..... cm^2

(Total for Question 3 is 5 marks)

Answers to Qn 15 (AO1): (No Calc) 43% of students got this right

11.	(*a*)		1	1	B1 cao
	(*b*)		$\frac{1}{7}$	1	B1 for $\frac{1}{7}$ (condone $\pm\frac{1}{7}$)
	(*c*)	$\frac{2^3 \div 2^3}{2^{4^3}} = \frac{2^5}{2^{12}}$	2^{-7}	3	M1 for writing one of the numbers correctly as a power of 2 M1 for $2^{'2'} \times 2^{'3'} = 2^{'2'+'3'}\left(=2^5\right)$ or $\left(2^{'4'}\right)^3 = 2^{'4'\times 3}\left(=2^{12}\right)$ or $\frac{2^{'5'}}{2^{'12'}} = 2^{'5'-'12'}$ A1 for 2^{-7} or $\frac{1}{2^{-7}}$ **OR** B1 for $\frac{1}{16^2}$ or an equivalent fraction with a numerator of 2 M1 for $2^{'4'} \times 2^{'4'} = 2^{'4'+'4'}\left(=2^8\right)$ or $\frac{2^{'1'}}{2^{'8'}} = 2^{'1'-'8'}$ A1 for 2^{-7} or $\frac{1}{2^7}$ [SC: B1 for an answer of $\frac{1}{128}$ if M0 scored]
		OR $\frac{2\times 16}{16\times 16\times 16} =$ $\frac{2}{16\times 16} = \frac{2}{2^4\times 2^4} = \frac{2}{2^8}$			

Answers to Qn 16 (AO1): (No Calc) 42% of students got this right

19(a)	4	B1	
	Additional Guidance		

19(b)	2 + 3 2 + 3 2 + 9	M1	Allow one error
	11 + 6 2	A1	
	Additional Guidance		

Answers to Qn 17 (AO1): (No Calc) 41% of students got this right

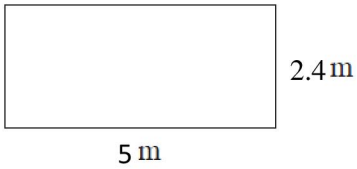
13.			75π	3	M1 for $(4 \times \pi \times 5^2) \div 2$ (or equivalent) M1 for $\pi \times 5^2$ (or equivalent) A1 for 75π (accept 235.5)

Answers to Qn 18 (AO1): (No Calc) 40% of students got this right

15	$2x + \frac{1}{x}$	B1	

Answers to Qn 19 (AO3): (No Calc) 40% of students got this right

5a The diagram shows a rectangular floor.



Felix is going to cover the floor with rectangular tiles.
Each tile is 50 cm by 40 cm.
$\frac{1}{6}$ of the tiles will be orange.
Some of the tiles will be purple.
The rest of the tiles will be red.

The ratio of the number of purple tiles to the number of red tiles will be 1 : 4

(a) Assuming there are no gaps between the tiles, how many tiles of each colour will Felix need?

Floor length = 5m = 500cm so can fit $\frac{500}{50} = 10$ tiles

Floor width = 2.4m = 240 cm so can fit $\frac{240}{40} = 6$ tiles

Total no. of tiles = $10 \times 6 = 60$ tiles

No. of orange tiles = $\frac{1}{6} \times 60 = 10$ tiles

Remaining tiles = 60-10=50

Purple : red $\quad 50 \div (1 + 4) = 50 \div 5 = 10$

$1 : 4$

$10 : 40$

So Felix needs 10 orange tiles, 10 purple tiles and 40 red tiles

orange tiles .....10.....

purple tiles ..... 10..... ..

red tiles ..... 40.....

(5)

Answers to Qn 20 (AO3): (No Calc) 40% of students got this right

14.		$\frac{8}{20}\times\frac{12}{19}+\frac{12}{20}\times\frac{8}{19}$ $\frac{8}{20}\times\frac{12}{20}+\frac{12}{20}\times\frac{8}{20}$ = $=\frac{192}{400}\ (=0.48)$ OR $1-(\frac{8}{20}\times\frac{7}{20}+\frac{12}{20}\times\frac{11}{20})$ $=\frac{212}{400}\ (=0.53)$	$\frac{192}{380}$	4	B1 for $\frac{8}{19}$ or $\frac{12}{19}$ M1 for $\frac{8}{20}\times\frac{12}{19}$ or $\frac{12}{20}\times\frac{8}{19}$ M1 for $\frac{8}{20}\times\frac{12}{19}+\frac{12}{20}\times\frac{8}{19}$ or $2\times\frac{8}{20}\times\frac{12}{19}$ A1 for $\frac{192}{380}$ (or equivalent) **With replacement** M1 for $\frac{8}{20}\times\frac{12}{20}$ or $\frac{12}{20}\times\frac{8}{20}$ M1 for $\frac{8}{20}\times\frac{12}{20}+\frac{12}{20}\times\frac{8}{20}$ or $2\times\frac{8}{20}\times\frac{12}{20}$ OR M1 for $\frac{8}{20}\times\frac{7}{20}+\frac{12}{20}\times\frac{11}{20}$ M1 for $1-\frac{188}{400}$

Ext ANSWERS 1 (AO1): (No Calc) Only 32% of students got this rigl

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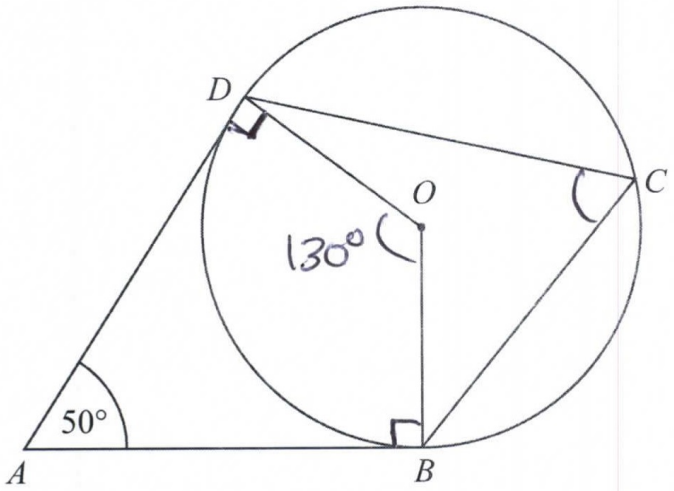


Diagram **NOT** accurately drawn

B, *C* and *D* are points on the circumference of a circle, centre *O*.
AB and *AD* are tangents to the circle.

Angle *DAB* = 50°

Work out the size of angle *BCD*.
Give a reason for each stage in your working.

ABO = 90° } (Angle at centre & tangent)
ADO = 90° }

DOB = 360 − 90 − 90 − 50
= 360 − 230
= 130 (∠s interior angles in quadrilateral)

DCB = 130 / 2
= 65° (Angle at centre half angle at circumference)

DCB = 65°

Ext ANSWERS 2 (AO1): (No Calc) Only 32% of students got this rigl

Paper 1MA1: 1H			
Question	**Working**	**Answer**	**Notes**
3 a	$\frac{1}{6}\times\frac{1}{5}\times 30\times 5=5$ $(\frac{5}{6}\times\frac{1}{5}+\frac{1}{6}\times\frac{4}{5}+\frac{1}{6}\times\frac{1}{5}$ $)\times 30\times 2$ $30-5-20$	5	P1 for identifying correct process to find probabilities for winnng scores. May include use of tree diagram or sample space P1 for correct process to find prize money P1 for completing correct process to find profit A1
b		Explanation	C1 for appropriate comment to interpret result eg probability so only likelihood not certainty, other than 30 may play, £5 is small difference.

Ext ANSWERS 3 (AO2): Only 32% of students got this right(3 mark

12.	(b)	$\frac{4(x-2)}{(x+2)(x-2)}+\frac{3(x+2)}{(x+2)(x-2)}$	$\frac{7x-2}{(x+2)(x-2)}$	3	M1 for denominator $(x+2)(x-2)$ (or equivalent) **or** x^2-4 M1 for $\frac{4(x-2)}{(x+2)(x-2)}$ (or equivalent) **or** $\frac{3(x+2)}{(x+2)(x-2)}$ (or equivalent) (NB. The denominator must be $(x+2)(x-2)$ **or** x^2-4 **or** another suitable common denominator) A1 for $\frac{7x-2}{(x+2)(x-2)}$ **or** $\frac{7x-2}{x^2-4}$ SC: If no marks awarded then award B1 for $\frac{4(x-2)}{x^2-2}+\frac{3(x+2)}{x^2-2}$ (or equivalent)