

# ADA PINPOINT PACKS

58\_to\_100\_Percent\_Pinpoint\_AI\_Pack

Made for Grade4to5

AO1,2\_and\_3

ALL\_Strands

Calc\_Only

Created by A.D.A:

Pinpoints Automatic Differentiation Algorithmn

Designed and Programmed by

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

## Question 1 (AO2): 41% of students got this right

13. Mrs Phillips needs to decide when to have the school sports day.

The table shows the number of students who will be at the sports day on each of 4 days.  
It also shows the number of teachers who can help on each of the 4 days.

	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>
<b>Number of students</b>	179	162	170	143
<b>Number of teachers</b>	15	13	14	12

For every 12 students at the sports day there must be at least 1 teacher to help.

On which of these days will there be enough teachers to help at the sports day?  
You must show all your working.

(Total for Question 24 is 3 marks)

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## Question 2 (AO2): 40% of students got this right

- 11** Polly has a full 5 kg sack of rice.  
She pours the rice from this sack into bags.  
She fills as many bags as possible.  
Each full bag contains 350 g of rice.  
Polly assumes that the rice from two sacks will fill twice as many bags as the rice from one sack.
- (b) Is Polly correct?  
You must give a reason for your answer.

## Question 3 (AO2): 38% of students got this right

7 Steve says,

“There are more prime numbers between 20 and 30  
than there are between 10 and 20”

Is Steve right?

You must show how you get your answer.



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 (AO2): 34% of students got this right

- 18** Buses to Ashby leave a bus station every 15 minutes.  
Buses to Barford leave the same bus station every 9 minutes.

A bus to Ashby and a bus to Barford both leave the bus station at 11 45 am.

When will a bus to Ashby and a bus to Barford next leave the bus station at the same time?

.....  
(Total for Question 18 is 3 marks)

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## Question 6 (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)**

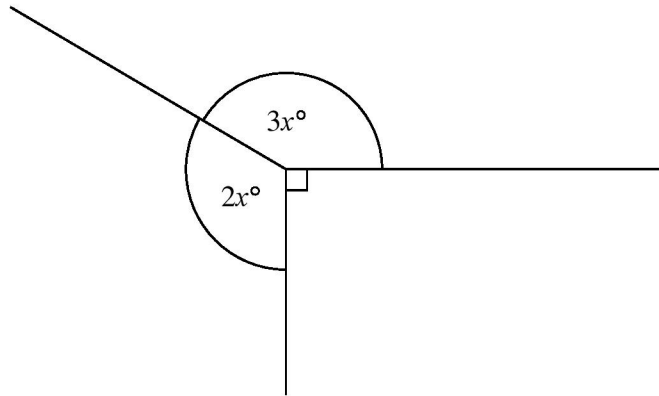
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## Question 7 (AO1): 31% of students got this right

- 19 (b) Find the highest common factor (HCF) of 168 and 180.

## Question 8 (AO1): 30% of students got this right

9

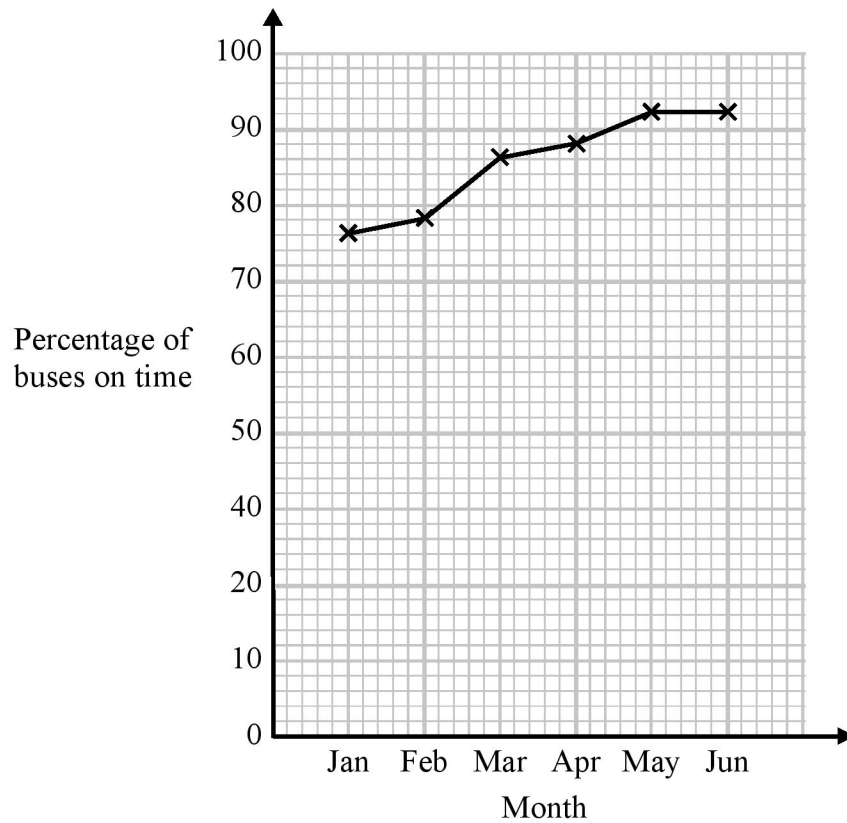


Find the value of  $x$ .

.....  
(Total for Question 9 is 3 marks)

## Question 9 (AO1): 29% of students got this right

- 8 Chrissy drew this graph to show the percentage of buses that got to a bus stop on time for six months.



- (a) Write down **one** thing that is wrong with the graph.

## Question 10 (AO1): 28% of students got this right

- 23.** Here are the first four terms of an arithmetic sequence.

3                      10                      17                      24

- (a) Find, in terms of  $n$ , an expression for the  $n$ th term of this arithmetic sequence.

.....  
(2)

- (b) Is 150 a term of this sequence?

You must explain how you get your answer.

.....  
.....  
.....  
.....  
.....  
(2)

**(Total 4 marks)**

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## Question 11 (AO2): 27% of students got this right

11 Robyn is describing a shape to her friend Lily.

Robyn says,

“The shape has four sides.  
It only has one pair of parallel sides.”

(a) What shape is Robyn describing?

.....  
(1)

Lily then describes a shape.

Lily says,

“The shape has four sides.  
It has two pairs of equal opposite sides.  
The opposite sides are parallel.”

Robyn says there are two possible shapes.

(b) Is she correct?

Explain your answer.

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

(Total for Question 11 is 2 marks)

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## Question 12 (AO1): 25% of students got this right

20.  $\mathbf{a} = \begin{pmatrix} 1 \\ 4 \end{pmatrix}$  and  $\mathbf{b} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$

(a) Write down as a column vector

(i)  $\mathbf{a} + \mathbf{b}$

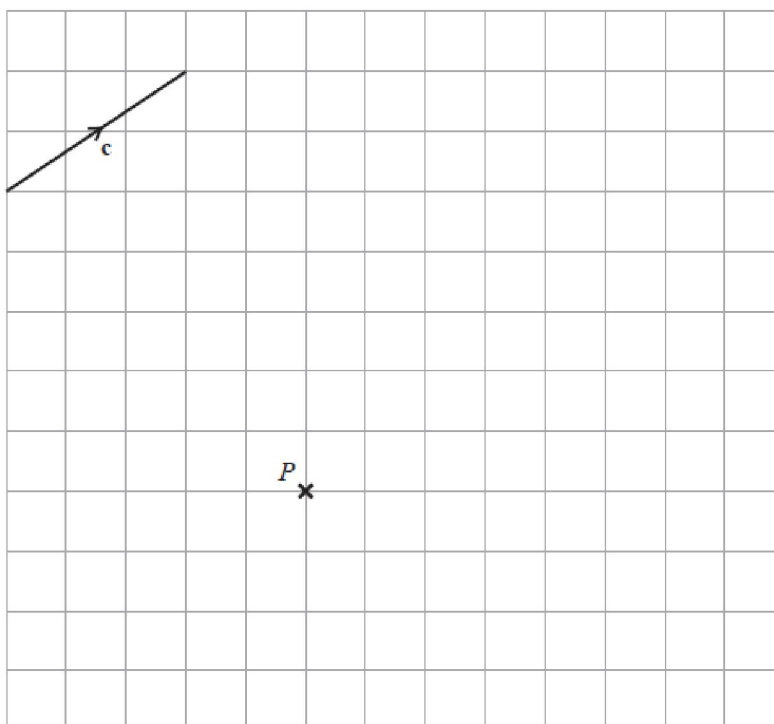
.....

(ii)  $2\mathbf{a} + 3\mathbf{b}$

.....

(3)

The vector  $\mathbf{c}$  is drawn on the grid.



(b) From the point  $P$ , draw the vector  $2\mathbf{c}$

(1)

(Total for Question 20 is 4 marks)

## Question 13 (AO2): 24% of students got this right

**20.** Joe and Ann buy some fruit from the same shop.

Joe buys 4 apples and 3 bananas for £2.50

Ann buys 3 apples and 4 bananas for £2.40

Work out the cost of

- (i) one apple,
- (ii) one banana.

(i) one apple ..... p

(ii) one banana ..... p

**(Total 5 marks)**

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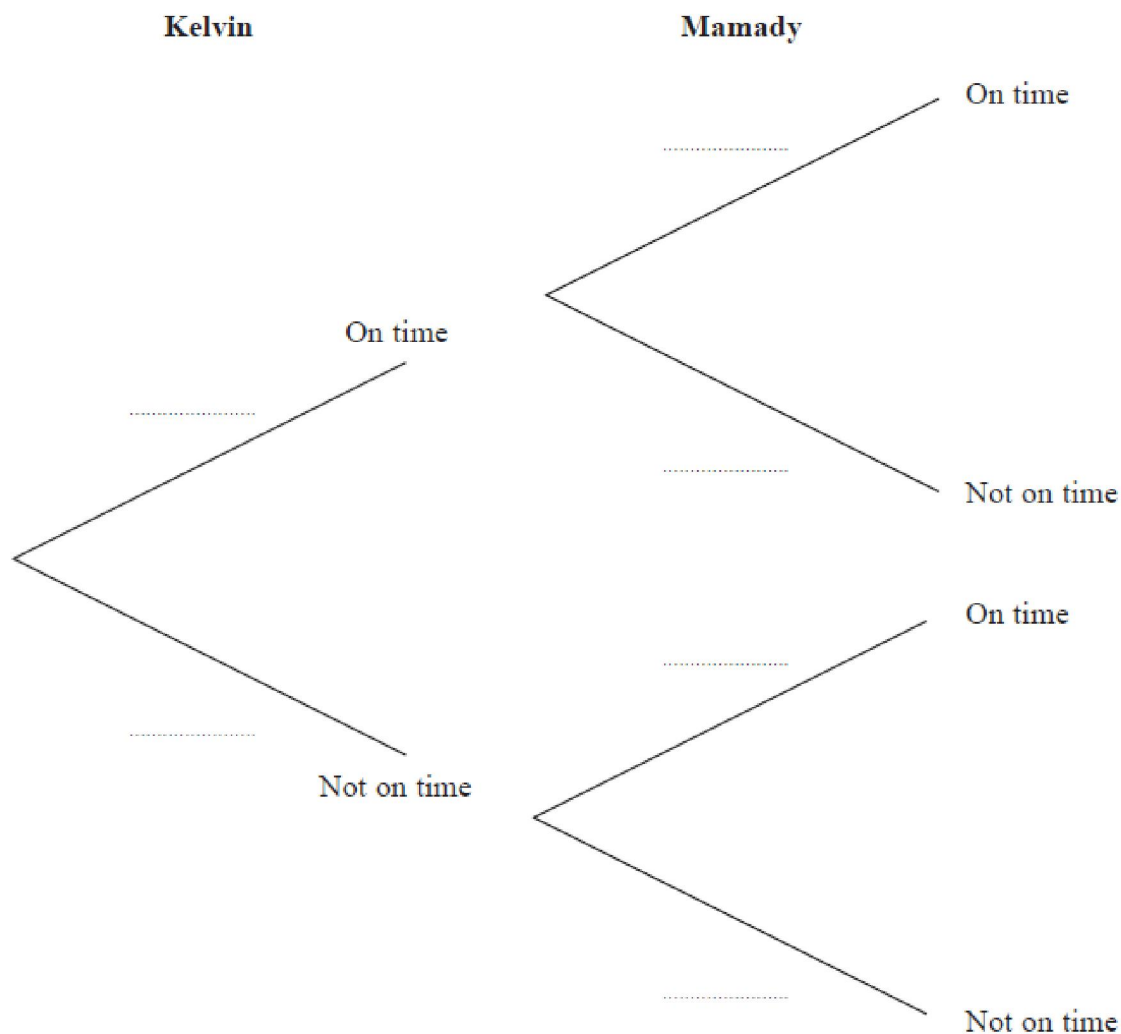
## Question 14 (AO1): 22% of students got this right

26 (b) Write 0.0704 in standard form.

# Question 15 (AO1): 21% of students got this right

27. Kelvin and Mamady are in the same class.  
The probability that Kelvin arrives on time is 0.7.  
The probability that Mamady arrives on time is 0.9.

Complete the probability tree diagram.



(2)

- (b) Work out the probability that Kelvin and Mamady both arrive on time.

(2)

(Total 4 marks)

## Question 16 (AO2): 20% of students got this right

- 18 Write an integer in the box to make the statement true.

$$\frac{3}{5} > \frac{9}{\square}$$

Explain why the statement is true.

.....

.....

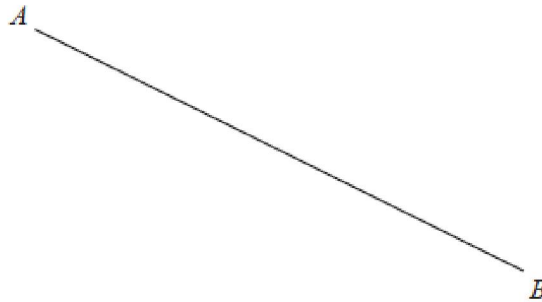
.....

.....

(Total for Question 18 is 2 marks)

## Question 17 (AO1): 18% of students got this right

24. In the space below, use ruler and compasses to construct the perpendicular bisector of line  $AB$ .



(Total for Question 24 is 2 marks)

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## Question 19 (AO1): 16% of students got this right

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

.....

(2)

(Total 4 marks)

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## Question 20 (AO2): 15% of students got this right

21. The diagram shows a triangle.

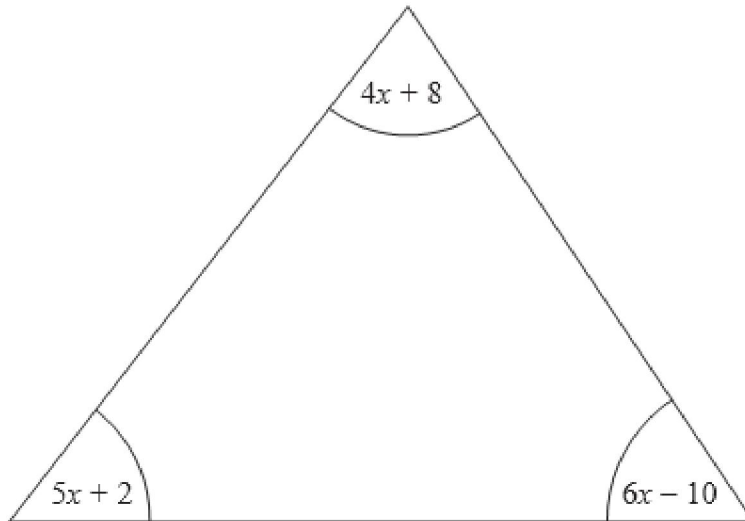


Diagram **NOT**  
accurately drawn

All the angles are measured in degrees.

Show that the triangle is isosceles.

(Total 5 marks)



Question 21 (AO1): 14% of students got this right

**3** Work out the reciprocal of 0.125.

## Question 22 (AO1): 13% of students got this right

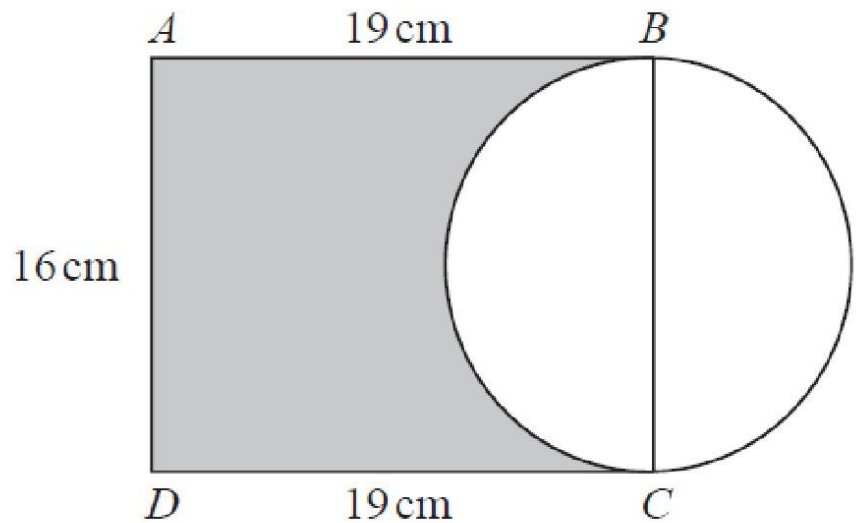
- 29** Samir invests £425 in a savings account.  
He gets 2.5% per annum compound interest.

How much money will Samir have in the account at the end of 3 years?

.....  
(Total for Question 29 is 2 marks)

Question 23 (AO3): 12% of students got this right

27 Here is a diagram showing a rectangle,  $ABCD$ , and a circle.



$BC$  is a diameter of the circle.

Calculate the percentage of the area of the rectangle that is shaded.  
Give your answer correct to 1 decimal place.

## Question 24 (AO3): 10% of students got this right

- 20.** One day Sadie and Gohil both buy petrol and oil from the same petrol station.

Sadie buys 30 litres of petrol and 4 litres of oil.  
Sadie pays a total £46.00

Gohil buys 24 litres of petrol and 8 litres of oil.  
Gohil pays a total of £45.20

Find the cost of one litre of petrol and the cost of one litre of oil.

Petrol £.....

Oil £.....

**(Total 5 marks)**

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## Question 25 (AO3): 10% of students got this right

- 22** Dev invests £2700 for 2 years.  
The compound interest rate is 1.6% per year.

- 22 (a)** Which calculation works out the total value after 2 years?  
Circle your answer.

[1 mark]

$$£2700 \times 1.6 \times 2$$

$$£2700 \times 1.6^2$$

$$£2700 \times 1.016 \times 2$$

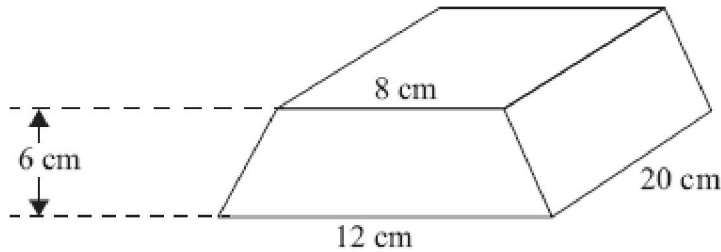
$$£2700 \times 1.016^2$$

- 22 (b)** Emma invests £2700 for 2 years.  
The interest rate is  
1.8% for the first year  
1.2% for the second year.  
Whose investment is worth more after 2 years?  
You **must** show your working.

[4 marks]

## Question 26 (AO1): 8% of students got this right

20.

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  $5 \text{ g/cm}^3$ .

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

..... kg

**(Total 5 marks)**

## Question 27 (AO1): 7% of students got this right

**16** Solve the simultaneous equations

$$3x + y = -4$$

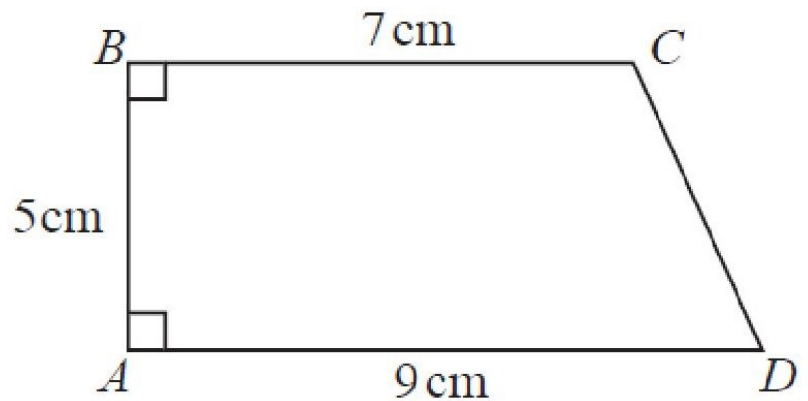
$$3x - 4y = 6$$

**(Total for Question 16 is 3 marks)**

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Question 28 (AO3): 5% of students got this right

28  $ABCD$  is a trapezium.



A square has the same perimeter as this trapezium.

Work out the area of the square.

Give your answer correct to 3 significant figures.



## Question 29 (AO3): 3% of students got this right

- 23.** On a school trip the ratio of the number of teachers to the number of students is 1 : 15

The ratio of the number of male students to the number of female students is 7 : 5

Work out what percentage of all the people on the trip are female students.

Give your answer correct to the nearest whole number.

.....%

**(Total for Question 23 is 3 marks)**

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# Answers to Qn 1 (AO2): 41% of students got this right

		13.	Tuesday and Friday	3	<p>M1 for <math>179 \div 12</math> or <math>162 \div 12</math> or <math>170 \div 12</math> or <math>143 \div 12</math></p> <p>A1 for 14.9(166...) or 15 and 13.5 or 14 and 14.1(66...) or 15 and 11.9(16...) or 12</p> <p>C1 (dep M1) ft for comparison of their results for all the days with the number of teachers available leading to a correct statement</p> <p><b>Or</b></p> <p>M1 for <math>179 \div 15</math> or <math>162 \div 13</math> or <math>170 \div 14</math> or <math>143 \div 12</math></p> <p>A1 for 11.9(3...) or 12 and 12.4(6...) or 13 and 12.1(4...) or 13 and 11.9(1...) or 12</p> <p>C1 (dep M1) ft for comparison of their results for all the days with 12 leading to a correct statement</p> <p><b>Or</b></p> <p>M1 for <math>15 \times 12</math> or <math>13 \times 12</math> or <math>14 \times 12</math> or <math>12 \times 12</math></p> <p>A1 for 180 and 156 and 168 and 144</p> <p>C1 (dep M1) ft for comparison of their results for all the days with the number of students taking part leading to a correct statement</p>
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Answers to Qn 2 (AO2): 40% of students got this right

Question	Working	Answer	Mark	Notes
11 (b)		Yes (supported)	B1	for Yes, with explanation, e.g. will fill 28 bags, ft from (a)

## Answers to Qn 3 (AO2): 38% of students got this right

Part	Working or answer an examiner might expect to see	Mark	Notes
7	11, 13, 17, 19; 23, 29	1	This mark is given for listing any of the numbers 11, 13, 17, 19, 23, 29 as prime numbers
	No; 11, 13, 17 and 19 are between 10 and 20, and 23 and 29 are between 20 and 30	1	This mark is given for the correct conclusion with supporting lists

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

Paper 1MA1: 3F			
Question	Working	Answer	Notes
19	$3.69 \times 2 = 7.38$	19	P1 for 7.38 repeatedly added at least 6 times OR $50 \div 7.38$ P1 for $6 \times 7.38 + 3.69$ A1 19 boxes
Grade4to5 and sample			

## Answers to Qn 5 (AO2): 34% of students got this right

- 18** Buses to Ashby leave a bus station every 15 minutes.  
Buses to Barford leave the same bus station every 9 minutes.

A bus to Ashby and a bus to Barford both leave the bus station at 11 45 am.

When will a bus to Ashby and a bus to Barford next leave the bus station at the same time?

15, 30, 45, 60,...

9, 18, 27, 36, 45,...

Every 45 mins

11:45 am + 45 mins = **12:30**

# Answers to Qn 6 (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 = $(6 \times 12) + 3 = 75$ 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 7 (AO1): 31% of students got this right

Question	Working	Answer	Mark	Notes
19      (b)		12	M1  A1	for attempt to list factors of 168 <b>and</b> 180 with at least 4 of each correct and none incorrect <b>or</b> correct prime factorisation of 180, e.g. $2 \times 2 \times 3 \times 3 \times 5$ or $2^2 \times 3^2 \times 5$  cao



# Answers to Qn 8 (AO1): 30% of students got this right

## Question 9 (Total 3 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
	$90 + 2x + 3x = 360$	M1	This mark is given for a method to form an equation
	$2x + 3x = 360 - 90$ $5x = 270$	M1	This mark is given for a method to solve the equation formed
	54	A1	This mark is given for the correct answer only

## Answers to Qn 9 (AO1): 29% of students got this right

Part	Working or answer an examiner might expect to see	Mark	Notes
8 (a)	The vertical scale is not linear	1	This mark is given for a correct comment

# Answers to Qn 10 (AO1): 28% of students got this right

		23. (a)	$7n - 4$	2	B2 for $7n - 4$  (B1 for $7n + d$ where $d$ is an integer)
		(b)	explanation	2	M1 for ' $7n - 4$ ' = 150  <b>or</b> any other valid method, e.g. counting on 7s (to get 150)  A1 for a complete explanation e.g. the 22nd term is 150 or $n = 22$ from solution of equation or a clear demonstration based on 22 or complete sequence

# Answers to Qn 11 (AO2): 27% of students got this right

11(a)		Trapezium	B1	
(b)		Explanation	C1	Explanation, e.g, yes, and could be either rectangle or parallelogram <b>or</b> no, and could be rectangle, parallelogram, square or rhombus

# Answers to Qn 12 (AO1): 25% of students got this right

20	(a)(i)		$\begin{pmatrix} 4 \\ 6 \end{pmatrix}$	B1	cao
	(ii)		$\begin{pmatrix} 11 \\ 14 \end{pmatrix}$	M1 A1	for $\begin{pmatrix} 2 \\ 8 \end{pmatrix}$ oe or $\begin{pmatrix} 9 \\ 6 \end{pmatrix}$ oe cao
	(b)		Diagram	B1	correct vector drawn

## Answers to Qn 13 (AO2): 24% of students got this right

Question	Working	Answer	Mark	Notes
20.	e.g. $4a + 3b = 250$ $3a + 4b = 240$  $(\times 3) \quad 12a + 9b = 750$ $(\times 4) \quad 12a + 16b = 960$  Subtract $7b = 210$ so $b = 30$  Substitute $4a + 90 = 250$ $4a = 250 - 90 = 160$	(i) 40  (ii) 30	5	B1 for correct equations expressed in terms of two variables (oe)  M1 for correct process to eliminate either variable (condone one arithmetic error)  A1 for either (£)0.4 or (£)0.3 (oe)  M1 (dep on first M1) for correct substitution of their found variable  A1 cao for both (i) 40 and (ii) 30

Answers to Qn 14 (AO1): 22% of students got this right

Question	Working	Answer	Mark	Notes
26 (b)		$7.04 \times 10^{-2}$	B1	cao

# Answers to Qn 15 (AO1): 21% of students got this right

27.	(a)		0.7, 0.3 0.9, 0.1, 0.9, 0.1	2	B1 for 0.7, 0.3 in correct position B1 for 0.9, 0.1, 0.9, 0.1 in correct position
	(b)		0.63	2	M1 0.7 × 0.9 ft from tree diagram A1



## Answers to Qn 16 (AO2): 20% of students got this right

- 18 Write an integer in the box to make the statement true.

$$\frac{3}{5} > \frac{9}{\square}$$

Any integer > 15

Explain why the statement is true.

$$3 \div 5 = 0.6$$

$$9 \div \text{"Integer > 15"} = \text{decimal smaller than } 0.6$$

Answers to Qn 17 (AO1): 18% of students got this right

24		construction	B2 (B1)	Correct construction showing all necessary arcs. (Pair of intersecting arcs centred on <i>A</i> and <i>B</i> )
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Answers to Qn 19 (AO1): 16% of students got this right

17	(b)	$v - u = at$	$a = \frac{v - u}{t}$ oe	2	M1 A1
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## Answers to Qn 20 (AO2): 15% of students got this right

21.			“two angles are <b>equal</b> so the triangle is <b>isosceles</b> ”	5	<p>M1 for <math>6x - 10 + 4x + 8 + 5x + 2</math> or <math>15x</math></p> <p>M1 for <math>6x - 10 + 4x + 8 + 5x + 2 = 180</math> or <math>15x = 180</math> or <math>(x =) 180 \div 15</math></p> <p>A1 <math>x = 12</math></p> <p>M1 (ft from '12' if M2 scored) for <math>5 \times '12' + 2</math> or <math>6 \times '12' - 10</math> or <math>62(^{\circ})</math> or <math>4 \times '12' + 8</math> or <math>56(^{\circ})</math></p> <p>C1 both base angles as 62 and two angles are equal so the triangle is isosceles</p> <p>NB. <math>x = 12</math> with no working scores M0M0A0 ; correct value of <math>x</math> from clear trial and improvement could gain M1M1A1</p> <p><b>OR</b></p> <p>M1 <math>5x + 2 = 6x - 10</math> or <math>2 + 10 = 6x - 5x</math></p> <p>A1 <math>x = 12</math></p> <p>M1 <math>5 \times 12 + 2</math> or <math>6 \times 12 - 10</math> or <math>62(^{\circ})</math> or <math>4 \times 12 + 8</math> or <math>56(^{\circ})</math></p> <p>M1 checking their angles add to <math>180^{\circ}</math>, “62”+”62”+”56” = 180</p> <p>C1 both base angles as 62 and two angles are equal so the triangle is isosceles</p> <p><b>OR</b></p> <p>M1 <math>4x + 8 = 5x + 2</math> oe or</p> <p><math>4x + 8 = 6x - 10</math></p> <p>A1 <math>x = 6</math> <b>or</b> <math>x = 9</math></p> <p>M1 (dep) for substituting ‘<math>x</math>’ into one of the angles oe</p> <p>M1 for showing their angles do not sum to <math>180^{\circ}</math></p> <p>C0</p>
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Answers to Qn 21 (AO1): 14% of students got this right

Paper 1MA1: 3F			
Question	Working	Answer	Notes
3		8	B1 cao
Grade4to5 and sample			

Answers to Qn 22 (AO1): 13% of students got this right

- 29 Samir invests £425 in a savings account.  
He gets 2.5% per annum compound interest.

How much money will Samir have in the account at the end of 3 years?

$$425 \times (1.025)^3$$

£457.68

Answers to Qn 23 (AO3): 12% of students got this right

Paper 1MA1: 2F			
Question	Working	Answer	Notes
27		66.9	<p>P1 for process to find the area of one shape, eg. <math>19 \times 16 (= 304)</math> or <math>\pi \times 8^2 (= 201.06\dots)</math></p> <p>P1 for process to find the shaded area, eg. "304" – "201.06" <math>\div 2 (= 203.46\dots)</math></p> <p>A1 for a complete process to find required percentage, eg. <math>\frac{203.46}{304} \times 100</math></p> <p>for answer in range 66 to 68</p>

## Answers to Qn 24 (AO3): 10% of students got this right

Question	Working	Answer	Mark	Notes
20.	$30x + 4y = 46$ $(\times 2)$ $24x + 8y = 45.20$ $(\times 0.5)$ Eg $60x + 8y = 92$ $24x + 8y = 45.20$ $36x = 46.8$ $x = \frac{46.8}{36}$ Eg $30x + 4y = 46$ $12x + 4y = 22.60$ $18x = 23.4$ $x = \frac{23.4}{18}$ <b>OR</b> Eliminates $x$ first <b>Or</b> substitution back into any correct equation	Petrol £1.30 Oil £1.75	5	B1 for correct equations expressed in terms of two variables (oe) M1 for correct process to eliminate either variable (condone one arithmetic error) A1 for either $x = £1.30$ or $£1.75$ oe M1 (dep on 1 <sup>st</sup> M1) for correct substitution of their found variable <b>OR</b> M1 (indep of 1 <sup>st</sup> M1 for a correct process to eliminate the other variable (condone one arithmetic error) A1 cao for both $x = £1.30$ and $£1.75$ oe (SC B1 for $x = £1.30$ , B1 for $y = £1.75$ oe if M0 scored)



# Answers to Qn 25 (AO3): 10% of students got this right

- 22** Dev invests £2700 for 2 years.  
The compound interest rate is 1.6% per year.

- 22 (a)** Which calculation works out the total value after 2 years?  
Circle your answer.

[1 mark]

$$£2700 \times 1.6 \times 2$$

$$£2700 \times 1.6^2$$

$$£2700 \times 1.016 \times 2$$

$$£2700 \times 1.016^2$$

- 22 (b)** Emma invests £2700 for 2 years.  
The interest rate is  
1.8% for the first year  
1.2% for the second year.  
Whose investment is worth more after 2 years?  
You **must** show your working.

[4 marks]

$$\text{Dev: } £2700 \times 1.016 \times 1.016 = £2787.09$$

$$\text{Emma: } £2700 \times 1.018 \times 1.012 = £2781.58$$

Answer \_\_\_\_\_ Dev

# Answers to Qn 26 (AO1): 8% of students got this right

20.		$\frac{1}{2} (12 + 8) \times 6 = 60$ $'60' \times 20 = 1200$ $1200 \times 5 = 6000$ $6000 \div 1000 = 6$	6	5	M1 $\frac{1}{2} (12 + 8) \times 6$ oe or 60 seen M1 (dep) $'60' \times 20$ M1 (indep) $'1200' \times 5$ A1 6000 cao A1 ft (dep on 1 <sup>st</sup> or 3 <sup>rd</sup> M1 scored) for 6
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## Answers to Qn 27 (AO1): 7% of students got this right

Paper: 1MA1/3F				
Question	Working	Answer	Mark	Notes
16		$x = -\frac{2}{3}$	M1	for a method to eliminate one variable (condone one arithmetic error)
		$y = -2$	M1	(dep) for substituting found value in one of the equations or appropriate method after starting again (condone one arithmetic error)
			A1	$x = -\frac{2}{3}$ oe and $y = -2$
Grade4to5 and sample				

## Answers to Qn 28 (AO3): 5% of students got this right

Paper 1MA1: 2F				
Question	Working	Answer	Notes	
28		43.5	P1	For process to establish a right-angled triangle with two sides of 5 cm and 9 – 7 = 2 cm
			P1	For correct application of Pythagoras, eg. $5^2 + 2^2$
			P1	for a complete process to find perimeter, eg. $9 + 7 + 5 + 5.39$ (= 26.385...)
			A1	for process to find area of square, eg. $(26.385... \div 4)^2$
				for answer in range 43.5 to 43.6

# Answers to Qn 29 (AO3): 3% of students got this right

Question	Working	Answer	Mark	Notes
23		39%	P1	Process to find proportion of group that are students , e.g. $\frac{15}{16}$
			P1	Complete process to find the % of girls , e.g. $\frac{15}{16} \times \frac{5}{12}$
			A1	for 39(.0625)
			OR	
			P1	Process to scale up the ratio of teachers : students, so that students can be divided by 7+5 (=12),, e.g. $1 \times 12 : 15 \times 12 = 12 : 180$ or a process to divide the “180” in the ratio 7:5,, e.g. $180 \div 12 \times 7 (=105)$ <b>and</b> $180 \div 12 \times 5 (=75)$
			P1	Complete process to find the % of girls , e.g. $(75 \div (12+105+75)) \times 100$
			A1	for 39(.0625)