ADA PINPOINT PACKS

76_to_100_Percent_Pinpoint_AI_Pack

Made for Grade8to9_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 (AO3): 24% of students got this right

9 Francesco carried out a survey about the ages of the people in his office.

The table shows information about his results.

Age (a years)	Cumulative frequency
$20 < a \leqslant 30$	10
$20 < a \leqslant 40$	26
$20 < a \leqslant 50$	58
$20 < a \leqslant 60$	66
$20 < a \leqslant 70$	70

Draw a cumulative frequency graph for this information.

Francesco says,

"More than 60% of the people in the office are between 35 and 55 years old."

(c) Use your graph to determine if Francesco is correct.

Question 2 (AO2): 23% of students got this right

18. A farmer wants to estimate the number of rabbits on his farm.

On Monday he catches 120 rabbits.
He puts a tag on each rabbit.
He then lets the rabbits run away.

On Tuesday the farmer catches 70 rabbits.
15 of these rabbits have a tag on them.

Work out an estimate for the total number of rabbits on the farm.
You must write down any assumptions you have made.

Question 3 (AO2): 23% of students got this right

16 (*a*) Show that the equation $x^3 - 3x^2 + 3 = 0$ has a solution between $x = 2$ and $x = 3$

Question 4 (AO3): 22% of students got this right

9. A rectangular lawn has a length of $3x$ metres and a width of $2x$ metres.
The lawn has a path of width 1 metre on three of its sides.

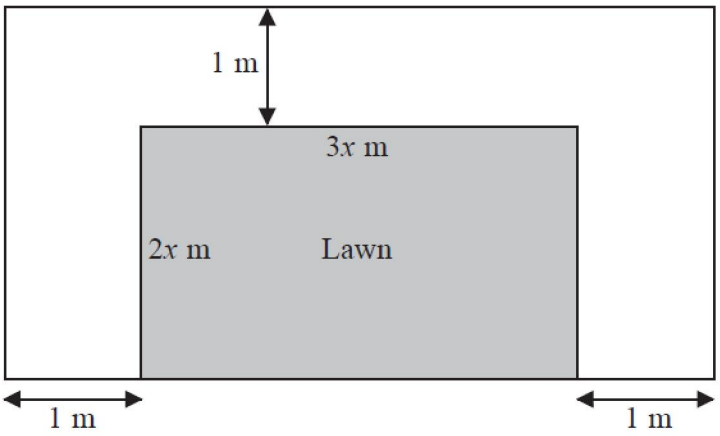


Diagram **NOT** accurately drawn

The total area of the lawn and the path is 100 m^2.

(*a*) Show that $6x^2 + 7x - 98 = 0$

(*b*) Calculate the area of the lawn.
Show clear algebraic working.

Question 5 (AO2): 21% of students got this right

15 (*a*) Show that the equation $x^3 + 7x - 5 = 0$ has a solution between $x = 0$ and $x = 1$

Question 6 (AO2): 21% of students got this right

10 Kieran also assumes that the population of the UK increases by 0.6% each year.

He says that it will take over 80 years for the population to increase by 50% because $\frac{50}{0.6} = 83.\dot{3}$

Kieran's method is wrong.

(*b*) Explain what is wrong with his method.

Question 7 (AO3): 20% of students got this right

17.

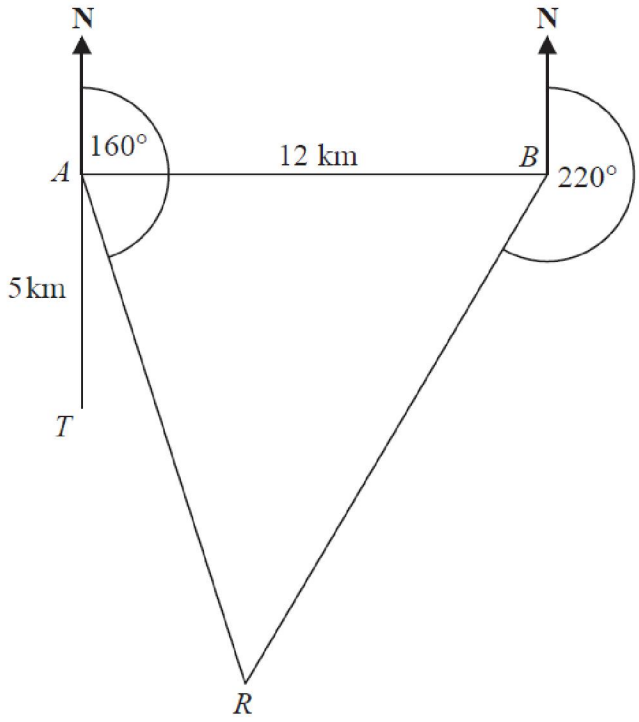


Diagram **NOT** accurately drawn

There is a coastguard station at point *A* and at point *B*.
B is due East of *A*.
The distance from *A* to *B* is 12 km.

There is a rowing boat at point *R*.
R is on a bearing of 160° from *A*.
R is on a bearing of 220° from *B*.

There is a speedboat at point *T*.
T is 5 km due South of *A*.

Work out the shortest distance from *T* to *R*.
Give your answer correct to 1 decimal place.
You must show all your working.

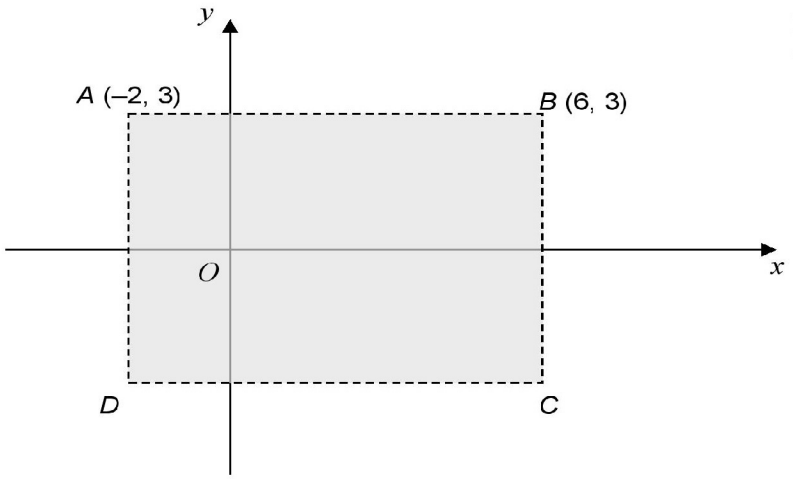
.....km

(Total 5 marks)

Question 8 (AO1): 20% of students got this right

19 (a) *ABCD* is a rectangle.

The x-axis is a line of symmetry.



Not drawn accurately

These inequalities describe the shaded region.

$p < x < q$ and $r < y < s$

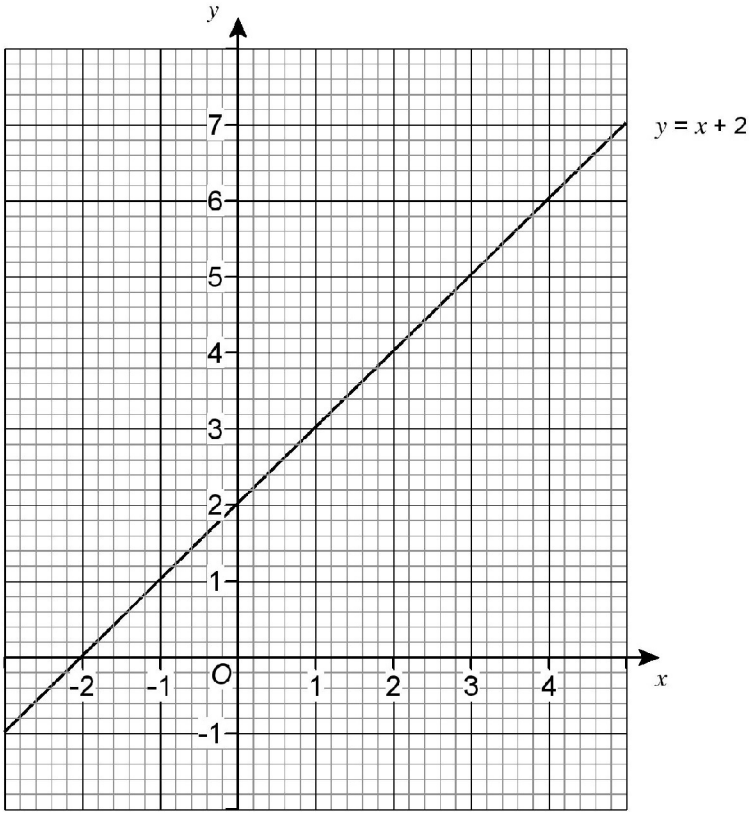
Write down the values of p, q, r and s.

[2 marks]

p = _____ q = _____

r = _____ s = _____

19 (b) The grid shows the graph of $y = x + 2$

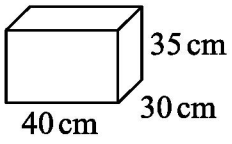


On the grid, identify the region represented by

Question 9 (AO2): 19% of students got this right

16 Chloe has a van.

She is going to use the van to deliver boxes.
Each box is a cuboid, 40 cm by 30 cm by 35 cm.



The space for boxes in the van has

maximum length 2.4 m
maximum width 1.5 m
maximum height 1.4 m

The space for boxes is empty.
Chloe wants to put as many boxes as possible into the van.

She can put 3 boxes into the van in one minute.
Assume that the space for boxes is in the shape of a cuboid.

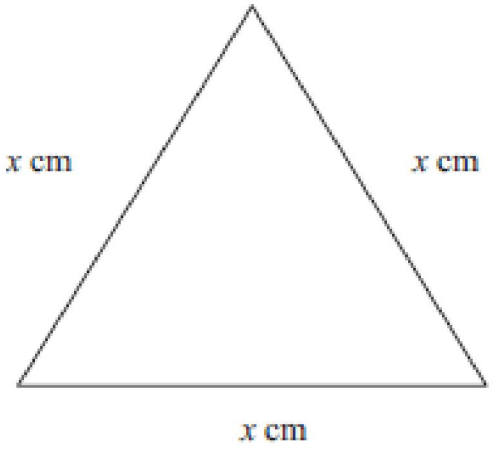
(*a*) Work out how many minutes it should take Chloe to put as many boxes as possible into the van.

The space for boxes might **not** be in the shape of a cuboid.

(*b*) Explain how this could affect the time it would take Chloe to put as many boxes as possible into the van.

Question 10 (AO3): 18% of students got this right

15. The diagram shows an equilateral triangle.

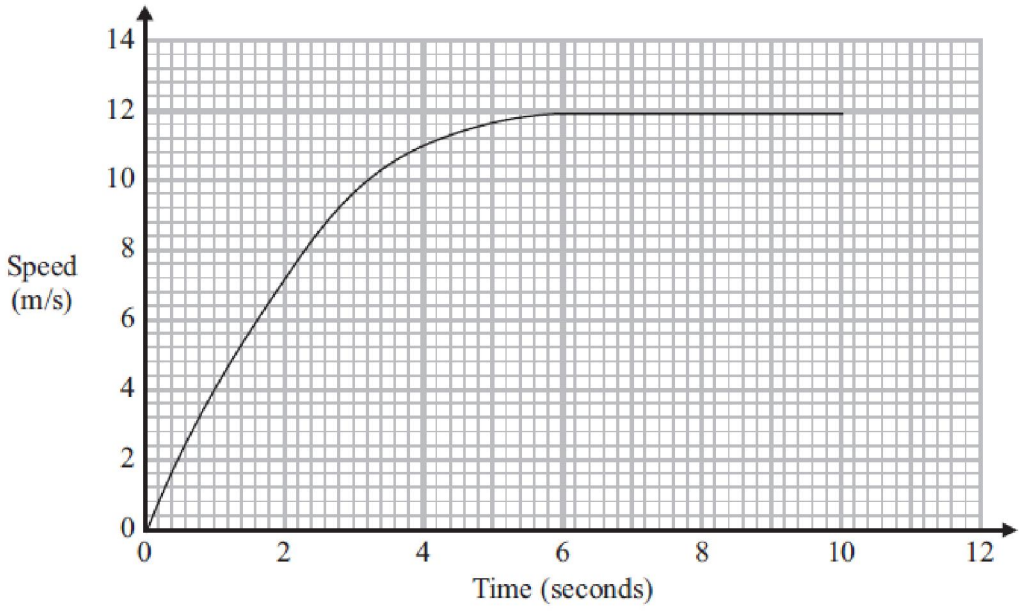


The area of the equilateral triangle is 36 cm^2.

Find the value of x.
Give your answer correct to 3 significant figures.

Question 11 (AO2): 18% of students got this right

16. An athlete is running in a race.
The diagram shows a speed-time graph for the athlete.



The athlete ran the race in 10 seconds.
The area under the graph gives the distance the athlete ran in the 10 seconds.

(b) Show that this race could have been a 100 metre race.

(3)

(Total 6 marks)

Question 12 (AO1): 17% of students got this right

15 Show that $\frac{a}{b+1}-\frac{a}{(b+1)^2}$ can be written as $\frac{ab}{(b+1)^2}$

Question 13 (AO2): 16% of students got this right

11 The cumulative frequency graph shows information about the weights of 60 potatoes.

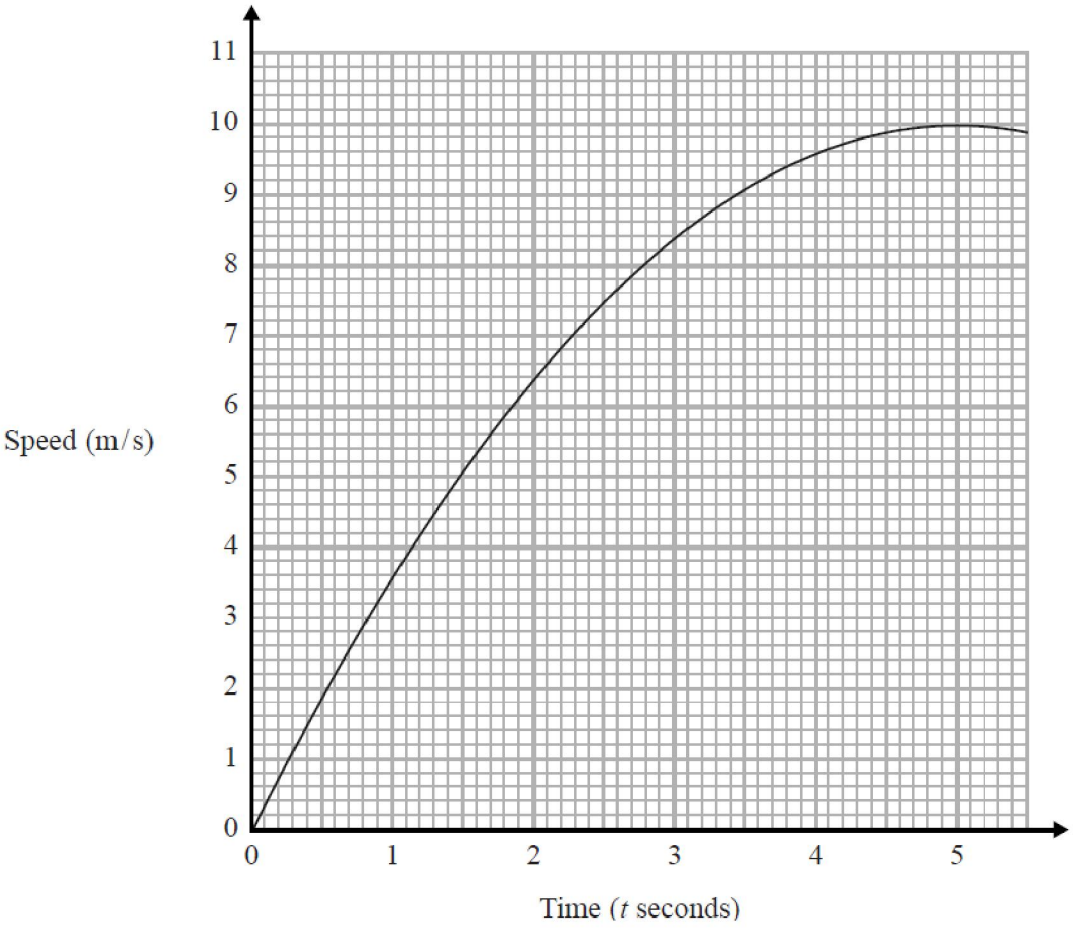
Jamil says,

"80 – 40 = 40 so the range of the weights is 40 g."

(*b*) Is Jamil correct?
You must give a reason for your answer.

Question 14 (AO1): 16% of students got this right

17 b Here is a speed-time graph showing the speed, in metres per second, of an object t seconds after it started to move.



(a) Use 3 strips of equal width to find an estimate for the area under the graph between $t = 1$ and $t = 4$

(b) Describe fully what your answer to part (a) represents.

.....

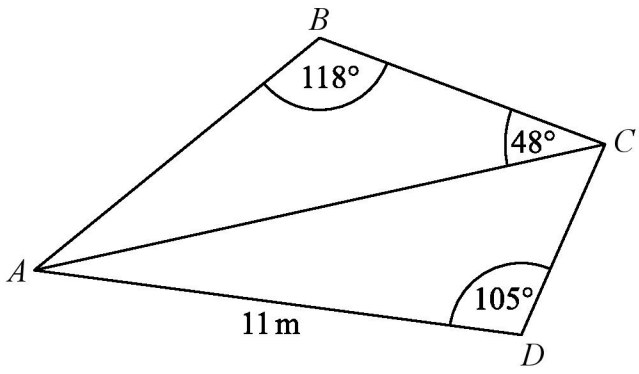
.....

.....

(2)

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

17 *ABC* and *ADC* are triangles.



The area of triangle *ADC* is 56 m^2

Work out the length of *AB*.
Give your answer correct to 1 decimal place.

Question 16 (AO3): 14% of students got this right

21. The points A, B and C lie in order on a straight line.

The coordinates of A are (2, 5)
The coordinates of B are (4, p)
The coordinates of C are (q, 17)

Given that $AC = 4AB$, find the values of p and q.

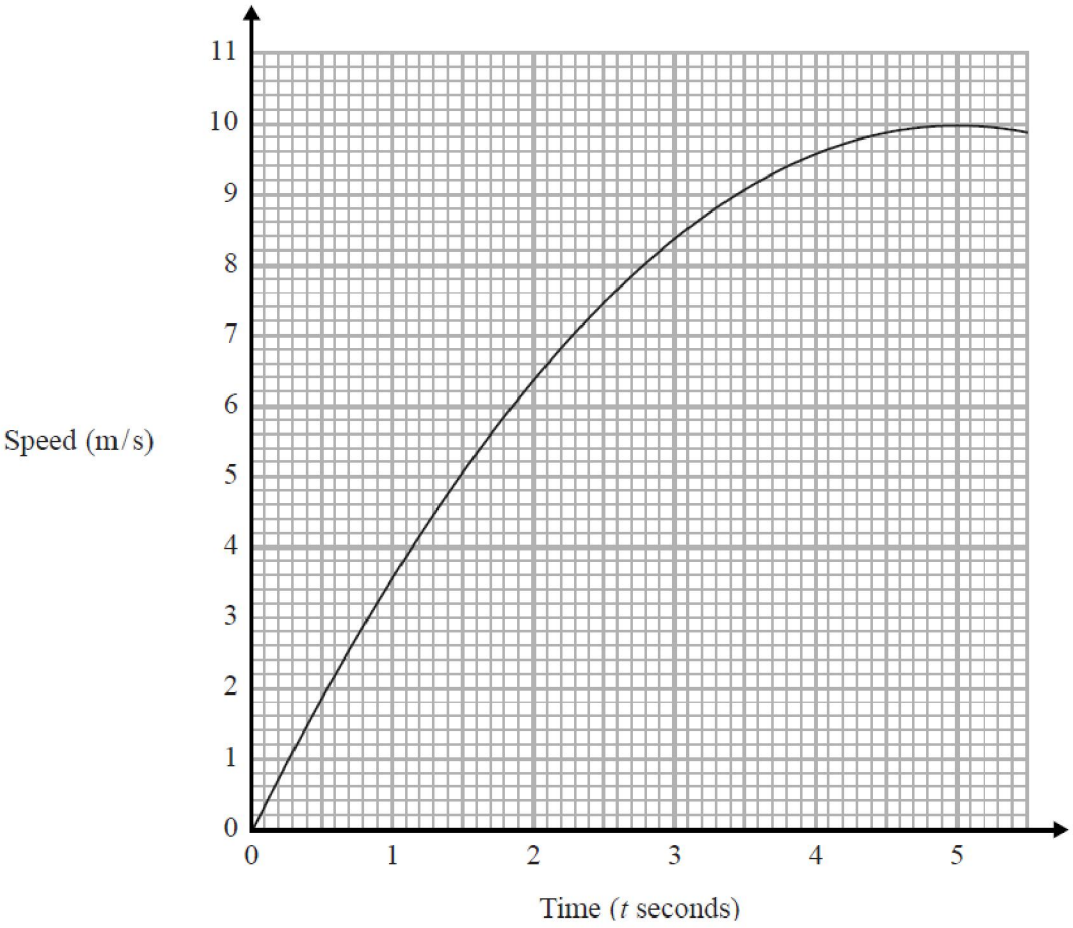
p = ...

q = ...

(Total 3 marks)

Question 17 (AO1): 13% of students got this right

17 a Here is a speed-time graph showing the speed, in metres per second, of an object t seconds after it started to move.



(a) Use 3 strips of equal width to find an estimate for the area under the graph between $t = 1$ and $t = 4$

.....

Question 18 (AO1): 12% of students got this right

16 Using $x_{n+1} = -2 - \frac{4}{x_n{}^2}$

With $x_0 = -2.5$,

(*a*) Find the values of x_1, x_2 and x_3

(3)

(*b*) Explain the relationship between the values of x_1, x_2 and x_3 and the equation $x^3 + 2x^2 + 4 = 0$

(2)

(Total for Question 16 is 5 marks)

Question 19 (AO3): 11% of students got this right

26. The diagram shows triangle *LMN*.

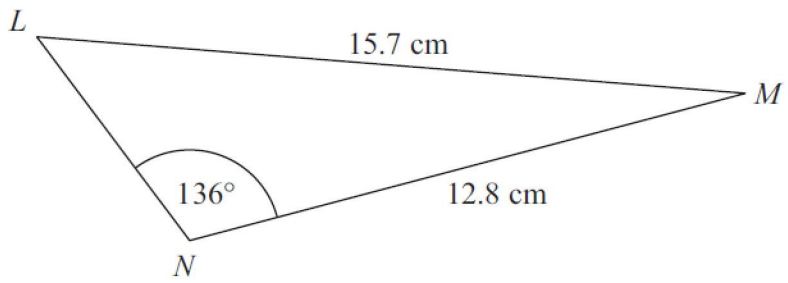


Diagram **NOT** accurately drawn

Calculate the length of *LN*.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 26 is 5 marks)

Question 20 (AO3): 11% of students got this right

24 *ABC* is a triangle.

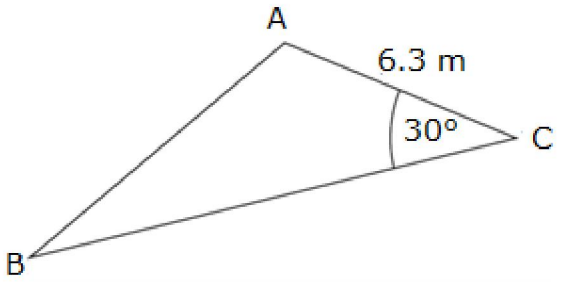


Diagram **NOT** accurately drawn

AC = 6.3 m
Angle *ACB* = 30°

The area of the triangle = 90 m^2.

Determine the length of *AB*.
Express your answer correct up to 3 significant figures.
Show all steps in your calculations.

..... m

(Total 5 marks)

Question 21 (AO1): 10% of students got this right

18 There are 20 women and 32 men in a sports club.

One woman is going to be chosen for the role of female captain.
A different woman is going to be chosen for the role of female vice-captain.
One man is going to be chosen for the role of male captain.
A different man is going to be chosen for the role of male vice-captain.

Work out how many different ways this can be done.

.....

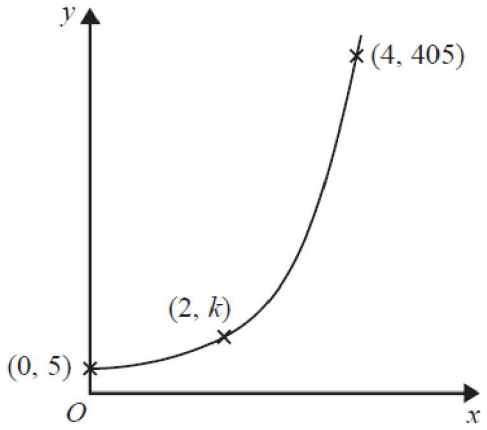
(Total for Question 18 is 3 marks)

Question 22 (AO1): 8% of students got this right

23 (*a*) Find the value of the reciprocal of 1.6.
Give your answer as a decimal.

Question 23 (AO3): 7% of students got this right

20 Here is a sketch of part of the graph of $y = pq^x$ where $q > 0$



The points (0, 5), (2, k) and (4, 405) are all on the graph of $y = pq^x$

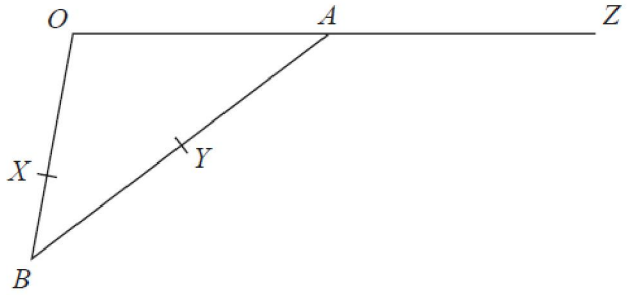
Find the value of k.

.....

(Total for Question 20 is 4 marks)

Question 24 (AO3): 7% of students got this right

21



OAB is a triangle.
A is the midpoint of *OZ*
Y is the midpoint of *AB*
X is a point on *OB*

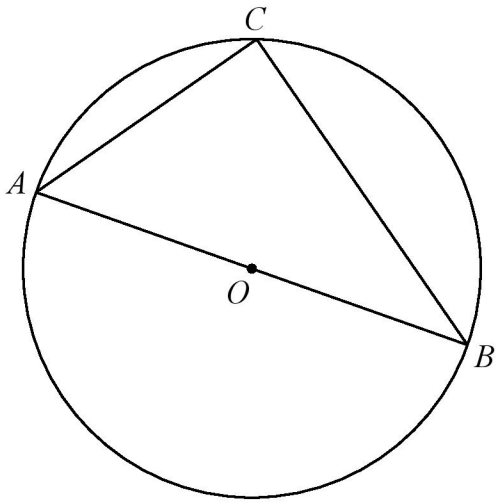
$\overrightarrow{OA} = \mathbf{a}$ $\overrightarrow{OX} = 2\mathbf{b}$ $\overrightarrow{XB} = \mathbf{b}$

Prove that *XYZ* is a straight line.

(Total for Question 21 is 5 marks)

Question 25 (AO2): 5% of students got this right

20



A, B and C are points on the circumference of a circle, centre O.
AOB is a diameter of the circle.

Prove that angle ACB is 90°
You must **not** use any circle theorems in your proof.

Question 26 (AO2): 3% of students got this right

26 When a drawing pin is dropped it can land point down or point up.

Lucy, Mel and Tom each dropped the drawing pin a number of times.

The table shows the number of times the drawing pin landed point down and the number of times the drawing pin landed point up for each person.

	Lucy	**Mel**	**Tom**
point down	31	53	16
point up	14	27	9

Rachael is going to drop the drawing pin once.

Stuart is going to drop the drawing pin twice.

(*b*) Use all the results in the table to work out an estimate for the probability that the drawing pin will land point up the first time and point down the second time.

Answers to Qn 1 (AO3): 24% of students got this right

Question		Working	Answer	Mark	Notes
9	(c)		Yes with justification	M1	for taking readings from graph at 35 **and** 55 years
				M1	for a correct calculation from their readings eg "44"÷70 (= 63%) or 60% of 70 = 42
				C1	for a correct conclusion and calculation from their readings, e.g. "44"÷70 (= 63%) or 60% of 70 = 42% (< "44")

Answers to Qn 2 (AO2): 23% of students got this right

Question		Working	Answer	Mark	Notes
18		$15 \div 70 = 120 \div n$ $120 \times 4.66(\ldots)$ OR $\frac{120 \times 70}{15}$ OR 8×70 OR $\frac{15}{70} \times 8/8 = \frac{120}{n}$ OR $120 \div 21.4 \times 100$	560	4	M2 $\frac{120 \times 70}{15}$ or $120 \times 4.66\ldots$ or 8×70 or $\frac{15}{70} \times 8/8 = \frac{120}{n}$ oe or $120 \div 21.4 \times 100$ (M1 for $\frac{15}{70}$ oe or 21.4% seen or $120 \div 15$ (= 8) or $\frac{15}{120}$ $(=\frac{1}{8})$ or $4.66(\ldots)$ seen) A1 560 cao C1 for a correct mathematical assumption eg population hasn't changed overnight or sample is random, etc.

Answers to Qn 3 (AO2): 23% of students got this right

Question	Working	Answer	Mark	Notes
16 (a)		Shown	M1	for method to establish at least one root in (2, 3), e.g. $f(x) = x^3 - 3x^2 + 3$, f(2) (= −1), f(3) (= 3) oe
			A1	for supportive explanation e.g. "since there is a change in sign there must be at least one root in $2 < x < 3$ (as f is continuous)" oe

Answers to Qn 4 (AO3): 22% of students got this right

Question		Working	Answer	Mark	Notes
9	(a)	$(3x + 2)(2x + 1) = 100$ $6x^2 + 4x + 3x + 2 = 100$	$6x^2 + 7x - 98 = 0$	2	M1 $(3x + 2)(2x + 1) = 100$ or $(2x \times 3x) + 2(2x + 1) + 3x = 100$ oe or $(2x \times 3x) + (2 \times 2x (\times 1)) + 1) + 3x + 1 + 1 = 100$ oe Other partitions are acceptable but partitioning must go on to form a correct equation. A1 Accept $6x^2 + 7x + 2 = 100$ if M1 awarded
	(b)	$(3x + 14)(2x - 7)$ $(= 0)$ $x = 3.5$ (Area =) $6 \times$ "3.5"^{2} or $(3 \times$ "3.5"$) \times (2 \times$ "3.5"$)$	73.5	5	M2 for $(3x + 14)(2x - 7)$ $(= 0)$ or $(x =)\frac{-7 \pm \sqrt{49 + 2352}}{12}$ or $(x =)\frac{-7 \pm \sqrt{2401}}{12}$ If not M2 then M1 for $(3x \pm 14)(2x \pm 7)$ or $(x =)\frac{-7 \pm \sqrt{7^2 - 4 \times 6 \times -98}}{2 \times 6}$ condone + in place of ± and 1 sign error. A1 Dependent on at least M1 Ignore negative root. M1ft Dependent on at least M1 and $x > 0$ A1 cao Dependent on first M1

Answers to Qn 5 (AO2): 21% of students got this right

Part	Working or answer an examiner might expect to see	Mark	Notes
15 (a)	f(0) = –5 and f(1) = 3,	1	This mark is given for showing the sign changes between f(0) and f(1)
	Thus since there is a sign change, the solution is between $x = 0$ and $x = 1$	1	This mark is given for a correct comment

Answers to Qn 6 (AO2): 21% of students got this right

Question		Working	Answer	Mark	Notes
10	(b)		explanation	C1	for explanation, e.g. growth is compound not simple oe, increase in population changes each year oe

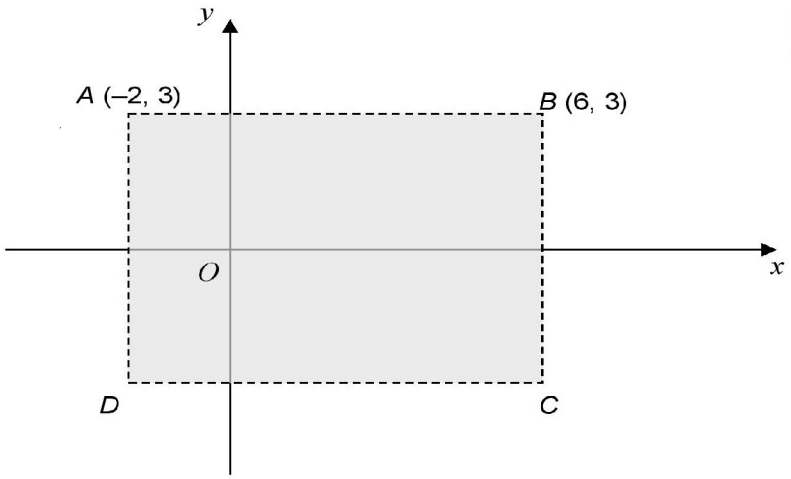
Answers to Qn 7 (AO3): 20% of students got this right

17.			6.2	5	M1 for a method to find an angle $RAB = 70$, $ABR = 50$, $BRA = 60$ or $TAR = 20$ M1 for substitution into sine formula $\frac{AR}{\sin"50"} = \frac{12}{\sin"60"}$ M1 for use of sine rule to find AR, $AR = \frac{12}{\sin"60"} \times \sin"50"$ (= 10.61) M1 for substitution into cosine formula $TR^2 = 5^2 + "10.61"^2 - 2 \times 5 \times "10.61" \times \cos 20$ (= 37.92) A1 for 6.15 – 6.2

Answers to Qn 8 (AO1): 20% of students got this right

19 (a) *ABCD* is a rectangle.

The x-axis is a line of symmetry.



Not drawn accurately

These inequalities describe the shaded region.

$p < x < q$ and $r < y < s$

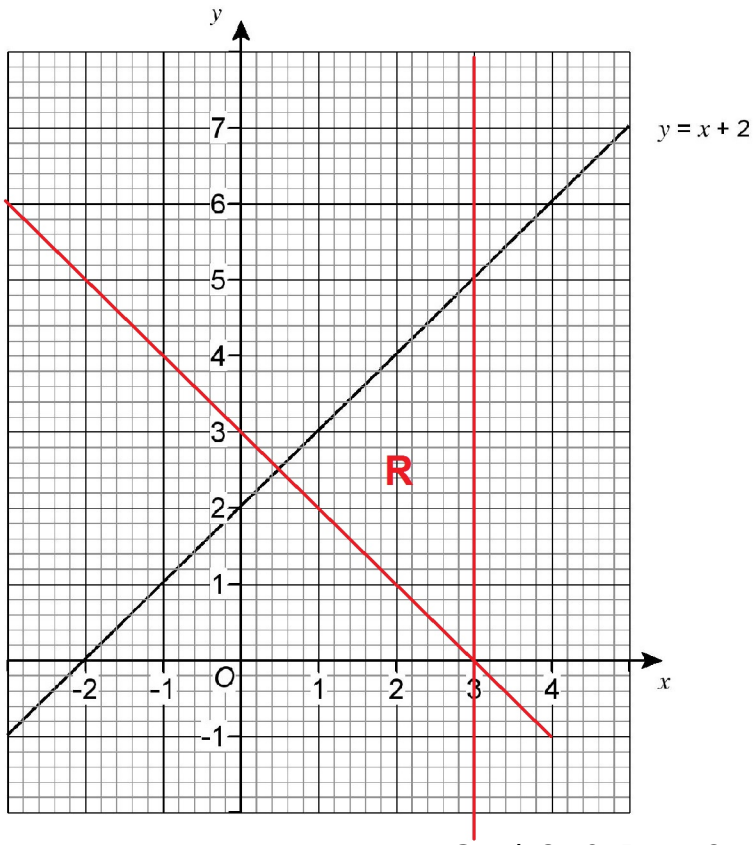
Write down the values of p, q, r and s.

[2 marks]

p = -2 q = 6

r = -3 s = 3

19 (b) The grid shows the graph of $y = x + 2$



On the grid, identify the region represented by

Answers to Qn 9 (AO2): 19% of students got this right

Part	Working or answer an examiner might expect to see	Mark	Notes
16 (a)	$0.40 \times 0.30 \times 0.35 = 0.042$	1	This mark is given for finding the volume of one box
	$2.4 \times 1.5 \times 1.4 = 5.04$	1	This mark is given for finding the volume of the van
	$5.04 \div 0.42 = 120$	1	This mark is given for finding how many boxes will fit in the van
	$120 \div 3 = 40$	1	This mark is given for finding how long it will take Chloe to put the boxes in the van
16 (b)	She will not be able to load as many boxes, so it will take less time	1	This mark is given for a correct statement

Answers to Qn 10 (AO3): 18% of students got this right

Question		Working	Answer	Mark	Notes
15		$\frac{1}{2}\times x^2\times\sin 60=36$ $x^2=\frac{72}{\sin 60}=83.13..$	9.12	3	M1 $\frac{1}{2}\times x^2\times\sin 60(=36)$ or $\frac{1}{2}\times ab\times\sin 60(=36)$ Or $\frac{1}{2}\times x\times\sqrt{x^2-\left(\frac{x}{2}\right)^2}\ (=36)$ M1 $x^2=\frac{72}{\sin 60}$ or $ab=\frac{72}{\sin 60}$ or $x^2=\frac{36\times 2}{\sqrt{0.75}}$ A1 9.11 – 9.12

Answers to Qn 11 (AO2): 18% of students got this right

Question		Working	Answer	Mark	Notes
16.	(b)	Example: 2(0 + 7) ÷ 2 = 7 2(7 + 11) ÷ 2 = 18 2(11 + 12) ÷ 2 = 23 2(12 + 12) ÷ 2 = 24 2(12 + 12) ÷ 2 = 24 Total = 96 **OR** Area ≈ 50 squares 1 square = 2 × 1 = 2 m 50 × 2 = 100	96 – 102 plus comparison	3	M1 for division of area into trapezia or counting squares M1 for use of at least one trapezium (oe) to calculate area or totalling all squares and part squares C1 (dep on M1) for answer in range 96 − 102 and positive comment to compare 'area' with 100 (SC B1 for area of 84 if M1 not scored)

Answers to Qn 12 (AO1): 17% of students got this right

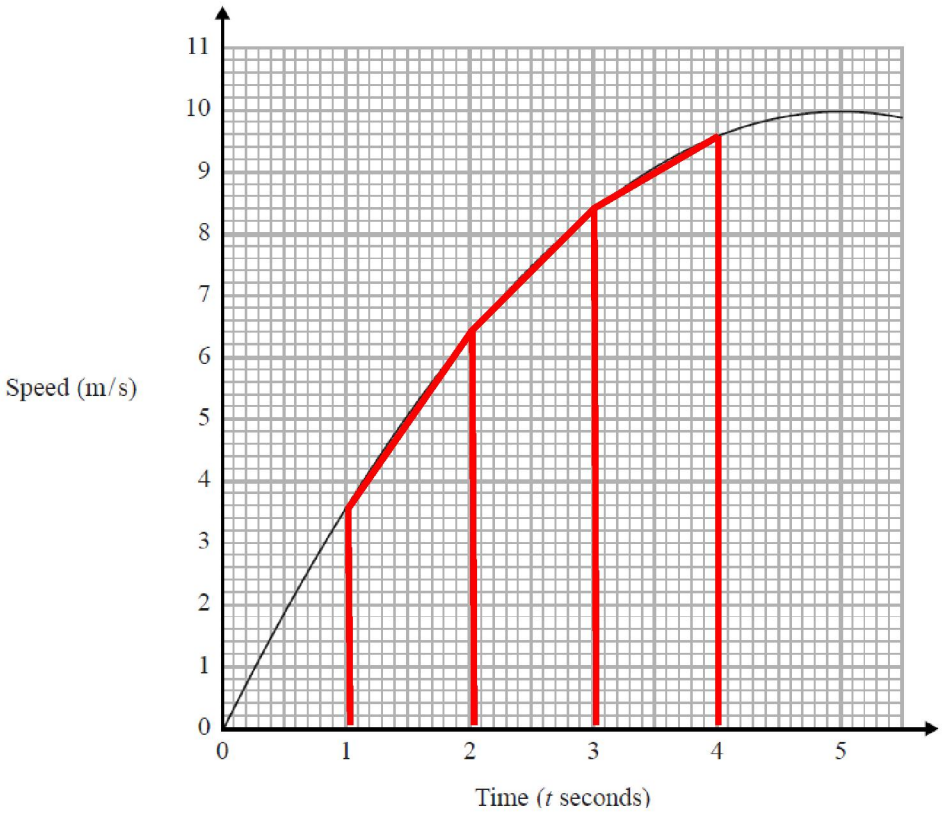
Paper 1MA1: 3H			
Question	**Working**	**Answer**	**Notes**
15		shown	C1 for $\frac{a(b+1)-a}{(b+1)^2}$ or $\frac{a(b+1)^2-a(b+1)}{(b+1)^3}$ oe C1 complete chain of reasoning

Answers to Qn 13 (AO2): 16% of students got this right

Part	Working or answer an examiner might expect to see	Mark	Notes
11 (b)	Not necessarily, since the maximum weight might be less than 80 and the minimum weight less than 40	1	This mark is given for a correct explanation

Answers to Qn 14 (AO1): 16% of students got this right

17 b Here is a speed-time graph showing the speed, in metres per second, of an object t seconds after it started to move.



(a) Use 3 strips of equal width to find an estimate for the area under the graph between $t = 1$ and $t = 4$ Area = 21.4

(b) Describe fully what your answer to part (a) represents.

The distance travelled by the object between 1 and 4 seconds after it started moving

(2)

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

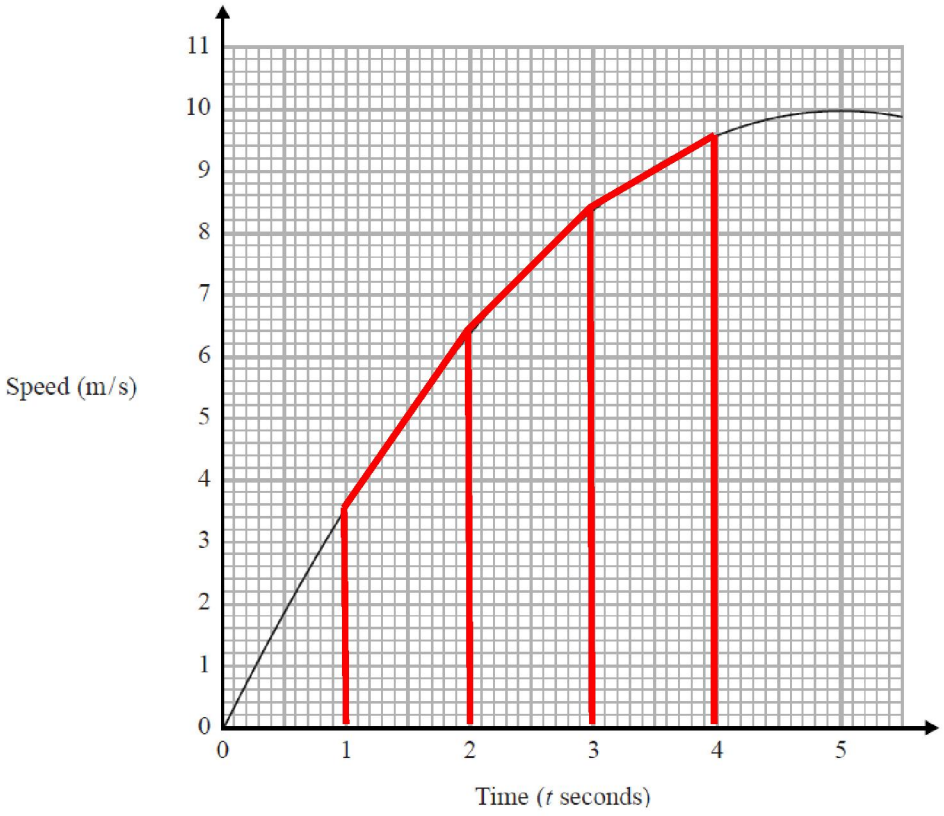
Part	Working or answer an examiner might expect to see	Mark	Notes
17	Area of triangle $ADC = \frac{1}{2}ab \sin C$ $= 0.5 \times 11 \times (CD \times \sin 105°) = 56$	1	This mark is given for finding an equation for the area of triangle ADC
	$CD = \frac{56}{0.5 \times 11 \times \sin 105°} = \frac{56}{5.312...}$ $= 10.54$	1	This mark is given for finding the length of CD
	$AC^2 =$ $11^2 + (10.54)^2 - 2 \times 11 \times 10.54 \times \cos 105°$ $= 232.0916 + 60.01496$ $= 292.10656$ $AC = 17.091125$	1	This mark is given for using the cosine rule $c^2 = a^2 + b^2 - 2ab \cos C$ to find the length of AC
	$\frac{AB}{\sin 48°} = \frac{AC}{\sin 118°}$ $\frac{AB}{0.743} = \frac{17.09}{0.883}$ $AB = \frac{17.09 \times 0.743}{0.883}$	1	This mark is given for a method to us the sine rule to find the length of AB
	14.38	1	This mark is given for an answer in the range 14.3 – 14.4

Answers to Qn 16 (AO3): 14% of students got this right

Question		Working	Answer	Mark	Notes
21			$p = 8$, $q = 10$	3	M1 for finding the difference between the x or y coordinates eg $4 - 2$ (= 2) or $17 - 5$ (= 12) M1 for a complete method to find the values of p or q A1 cao

Answers to Qn 17 (AO1): 13% of students got this right

17 a Here is a speed-time graph showing the speed, in metres per second, of an object t seconds after it started to move.



(a) Use 3 strips of equal width to find an estimate for the area under the graph between $t = 1$ and $t = 4$

$$\text{Area} = \frac{(3.6+6.4)}{2} \times 1 + \frac{(6.4+8.4)}{2} \times 1 + \frac{(8.4+9.6)}{2} \times 1$$

$$= 21.4$$

.....

(3)

Answers to Qn 18 (AO1): 12% of students got this right

Question 16 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$x_1 = -2.64$	M1	This mark is given for the substitution of -2.5 into the equation to find a value for x_1
	$x_2 = -2.57392$	M1	This mark is given for the substitution of x_1 to give x_2
	$x_3 = -2.603767255$	A1	This mark is given for the substitution of x_3 to give x_3
(b)	The iterative form is a rearrangement of the equation	C1	This mark is given for a correct statement
	Each iteration gives an estimation of a solution to the equation	C1	This mark is given for a correct statement

Answers to Qn 19 (AO3): 11% of students got this right

26 The diagram shows triangle *LMN*.

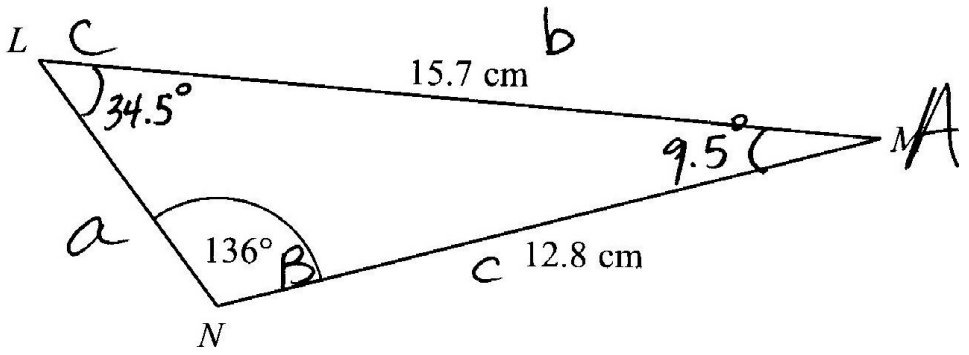


Diagram **NOT** accurately drawn

Calculate the length of *LN*.
Give your answer correct to 3 significant figures.

use sine rule to work out $\angle MLN$

$$\frac{\sin(\angle LMN)}{12.8} = \frac{\sin 136}{15.7}$$

$$\sin(\angle LMN) = 0.566345678$$

$$\angle LMN = 34.4957...^\circ$$

$$\angle LMN = 180 - 34.495 - 136$$
$$= 9.5042^\circ$$

cosine rule to find side length LN

$$a^2 = b^2 + c^2 - 2bc\cos A$$
$$= 15.7^2 + 12.8^2 - 2(15.7)(12.8)\cos(9.5^\circ)$$
$$= 246.49 + 163.84 - 396.407909$$
$$a^2 = 13.922$$
$$a = \sqrt{13.922} = 3.73123...$$

Answers to Qn 20 (AO3): 11% of students got this right

24			51.8	5	M1 for $\frac{1}{2} \times 6.3 \times x \times \sin 30 = 90$ M1 for 90÷(0.5×6.3×sin 30) (= 57.(142...)) M1 (dep on 1st M1) for substituting the appropriate figures into the cosine rule eg $6.3^2+'57.142'^2-2\times6.3\times'57.142'\cos30^\circ$ M1 (dep on previous M1) for correct order of evaluation or ($c^2=$) 2681.(483...) A1 51.7 – 51.8

Answers to Qn 21 (AO1): 10% of students got this right

18 There are 20 women and 32 men in a sports club.

One woman is going to be chosen for the role of female captain.
A different woman is going to be chosen for the role of female vice-captain.
One man is going to be chosen for the role of male captain.
A different man is going to be chosen for the role of male vice-captain.

Work out how many different ways this can be done.

$20 \times 19 \times 32 \times 31 = 376\,960$ different ways

.....

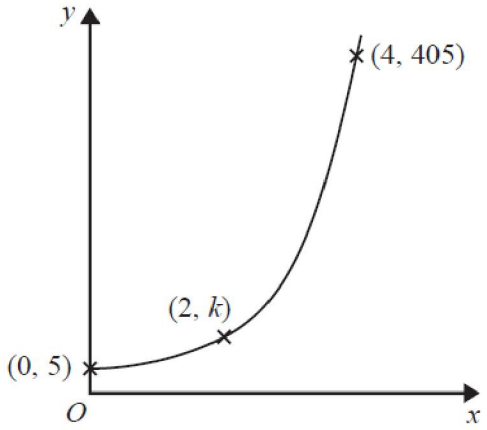
(Total for Question 18 is 3 marks)

Answers to Qn 22 (AO1): 8% of students got this right

Part	Working or answer an examiner might expect to see	Mark	Notes
23 (a)	$\frac{1}{1.6} = 0.625$	1	This mark is given for the correct answer only

Answers to Qn 23 (AO3): 7% of students got this right

20 Here is a sketch of part of the graph of $y = pq^x$ where $q > 0$



The points (0, 5), (2, k) and (4, 405) are all on the graph of $y = pq^x$

Find the value of k.

$(0,5) \rightarrow \quad 5 = pq^0 \quad \rightarrow \quad p = 5$

$(4,405) \rightarrow \quad 405 = 5q^4 \quad \rightarrow \quad q^4 = 81 \quad \rightarrow \quad q = 3$

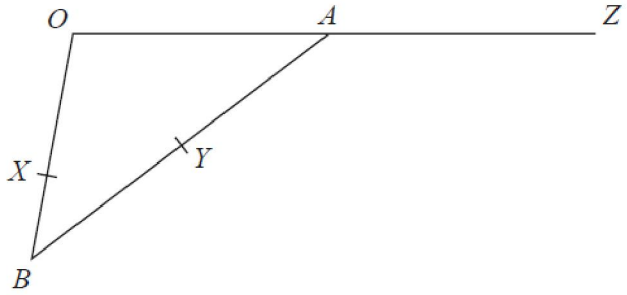
$(2,k) \rightarrow \quad k = 5 \times 3^2 = \mathbf{45}$

.....

(Total for Question 20 is 4 marks)

Answers to Qn 24 (AO3): 7% of students got this right

21



OAB is a triangle.
A is the midpoint of *OZ*
Y is the midpoint of *AB*
X is a point on *OB*

$\overrightarrow{OA} = \mathbf{a}$ $\overrightarrow{OX} = 2\mathbf{b}$ $\overrightarrow{XB} = \mathbf{b}$

Prove that *XYZ* is a straight line.

$\overrightarrow{XZ} = 2\boldsymbol{a} - 2\boldsymbol{b} = 2(\boldsymbol{a} - \boldsymbol{b})$

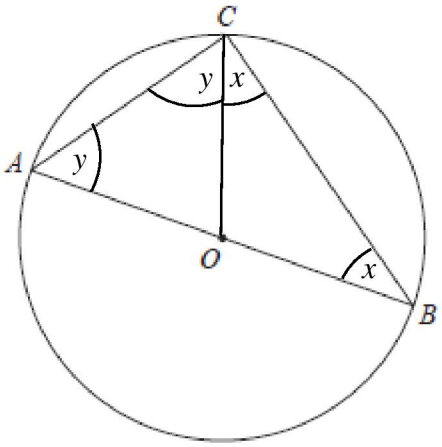
$\overrightarrow{BA} = \boldsymbol{a} - 3\boldsymbol{b}$

$\overrightarrow{XY} = \boldsymbol{b} + \frac{1}{2}(\boldsymbol{a} - 3\boldsymbol{b}) = \frac{1}{2}\boldsymbol{a} + \boldsymbol{b} - \frac{3}{2}\boldsymbol{b} = \frac{1}{2}\boldsymbol{a} - \frac{1}{2}\boldsymbol{b} = \frac{1}{2}(\boldsymbol{a} - \boldsymbol{b})$

Since $\overrightarrow{XY}$ and $\overrightarrow{XZ}$ both contain $(\boldsymbol{a} - \boldsymbol{b})$ they are parallel and so XYZ is a straight line.

(Total for Question 21 is 5 marks)

Answers to Qn 25 (AO2): 5% of students got this right

Part	Working or answer an examiner might expect to see	Mark	Notes
20	 base angles of an isosceles triangle are equal	1	This mark is given for drawing the line *OC* to make an isosceles triangles *OBC* and *AOC*
	$x + x + y + y = 180°$ angles in a triangle add up to 180	1	This mark is given for finding the sum of the angles in triangle *ABC*
	$2x + 2y = 2(x + y) = 180$, so $x + y$ = angle $ACB = 90°$	1	This mark is given for a complete proof to show ACB = 90°
		1	This mark is given for a complete proof with all reasons given

Answers to Qn 26 (AO2): 3% of students got this right

Part	Working an or answer examiner might expect to see	Mark	Notes
26 (b)	$\frac{100}{150} \times \frac{50}{150} = \frac{2}{3} \times \frac{1}{3}$	1	This mark is given for a probability of point down multiplied by the probability of point up
	$\frac{2}{9}$	1	This mark is given for the correct answer only