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4. Cherie travels from Singapore to Malaysia. She exchanges S\$700 into Malaysian Ringgits (RM) when the exchange rate is S\$1 = RM2.77. In Malaysia, she spends RM1 507. On her return, she exchanges the remaining Malaysian Ringgits into Singapore dollars when the exchange rate is S\$1 = RM2.88. How many Singapore dollars will she receive?

For
Examiner's
Use

1. By writing each number correct to 1 significant figure, estimate the value

$$\text{of } \frac{27.19 \times 633.1}{0.3265}.$$

You must show your working.

Answer [2]

2. Mary leaves home at 8.45 a.m. and travels to work at an average speed of 51 km/h. She arrives at work at 9.05 a.m.
How far is it from Mary's home to her work place?

Answer km [2]

3. Solve $(x - 7)(2x + 1) = 0$.

Answer $x =$ or [2]

[Turn over

Answer S\$ [2]

5. (a) Find the lowest common multiple (LCM) of 36 and 60.

Answer (a) LCM = [1]

- (b) The cube root of p is 2×3^2 . Find p as the product of its prime factors.

(b) $p =$ [1]

[Turn over

6. The price of washing machine is \$900.
Mrs Lim decides to pay by hire-purchase. She pays 15% deposit and then 12 equal instalments of \$72.
How much does she pay in total?

For
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Use

Answer \$ [2]

7. A group of 7 girls has a mean height of 1.65 m.
When Sally joins the group, the mean height is 1.64 m.
Find Sally's height.

Answer m [2]

[Turn over]

8. Given that $P = \frac{RT}{v - b}$, express b in terms of P , R , T and v .

For
Examiner's
UseAnswer $b =$ [2]

9. (a) Name the special quadrilateral with four equal sides and unequal diagonals.

Answer (a) [1]

- (b) Find the interior angle of a regular 12-sided polygon.

Answer (b) ° [2]

[Turn over]

10. The following figures represent a series of patterns formed with toothpicks.



Figure 1

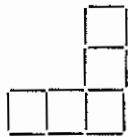


Figure 2

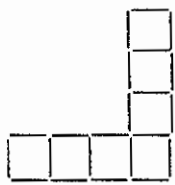


Figure 3

- (a) State the number of squares in Figure 4.

Answer (a) _____ squares [1]

- (b) Express in terms of n , the number of squares in Figure n .

Answer (b) _____ squares [1]

- (c) Which figure has 100 toothpicks?

Answer (c) Figure _____ [1]

11. The mass of one electron is 0.000 000 000 000 000 000 000 000 91 grams.

(a) Write 0.000 000 000 000 000 000 000 000 91 in standard form.

Answer (a) _____ [1]

- (b) Calculate the mass of five million electrons.

Give your answer, in grams, in standard form.

Answer (b) _____ g [2]

[Turn over]

12. Solve the following simultaneous equations

$$x + 5y = 0,$$

$$3x + 2y = 13.$$

Show your working clearly.

Answer x = _____

y = _____ [3]

[Turn over]

13. (a) Simplify $\frac{4h}{3} \div \frac{2h^2}{27}$.

Answer (a) [1]

(b) Expand and simplify $7(2x - 1) + 3(x - 7)$.

Answer (b) [2]

14. (a) Solve the inequality $8x \geq 30$.

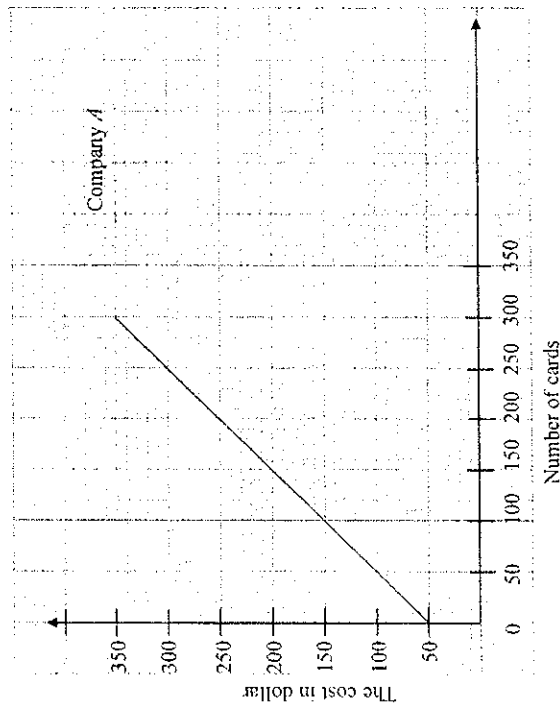
Answer (a) [1]

(b) Solve $\frac{18}{y-3} - 12$.

Answer (b) $y =$ [2]

[Turn over

15. Two companies, *A* and *B*, provide printing services. The graph below is used by Company *A* to work out the cost in dollars of printing various numbers of name cards.



- (a) Find the cost of printing 150 cards in Company *A*.

Answer (a) \$ [1]

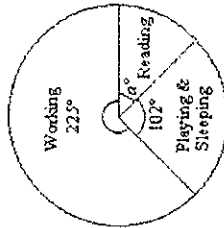
- (b) Company *B* charges a basic cost of \$150 for the first 100 cards plus a fixed rate of \$20 per 50 cards thereafter.

On the grid, draw a graph to show the charges made by Company *B* for printing up to 350 cards. [1]

- (c) Which company would charge cheaper for printing 250 cards and by how much?

Answer (c) Company cheaper by \$ [1]

[Turn over



The pie chart shows how Siti spends the 24 hours in a day.
(a) Calculate the angle of the sector representing reading.

Answer (a) _____° [1]

(b) For each of the seven days of the week, Siti spends the same amount of time working.
How many minutes did she spend working that week?

Answer (b) _____ minutes [2]

Turn over

17. (a) Write these numbers in ascending order.

$49^{\frac{1}{2}}$ $8^{\frac{1}{3}}$ 5^0 $4^{\frac{3}{2}}$

Answer (a) _____ [1]

(b) Given that $16^5 \times 64^{\frac{1}{2}} = 4^x$, find x .

Answer (b) $x =$ _____ [2]

18. A plan of a house is drawn on the scale of 1 : 25.
(a) The width of the house is 8 m.

How wide, in metres, is the plan of the house?

Answer (a) _____ m [1]

(b) The floor area of the plan is 900 cm².

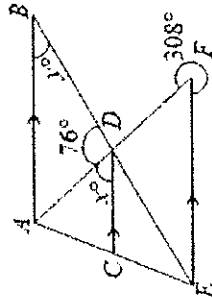
What is the floor area, in square metres, of the house?

Answer (b) _____ m² [2]

Turn over

19.

11



The diagram is not drawn to scale. Find, stating the reasons clearly,

(a) x° .

Answer (a) $x^\circ = \dots\dots\dots [2]$

(b) y° .

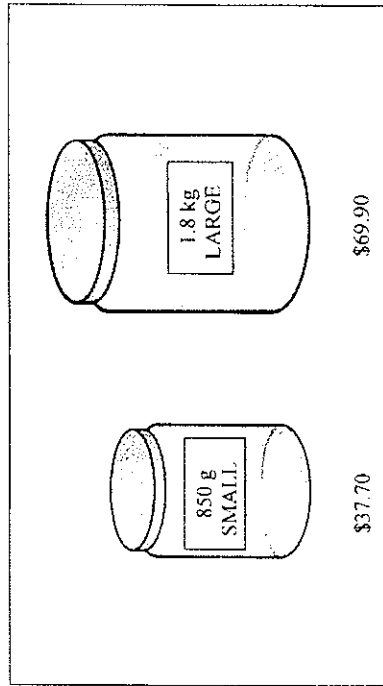
(b) $y^\circ = \dots\dots\dots [2]$

[Turn over

For
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Use

12

20. A particular milk powder is sold in 2 sizes, small and large.



Find which of the two sizes gives the better value. Justify your answer.

You must show all your working.

Answer

The $\dots\dots\dots$ size gives the better value. [3]

[Turn over

For
Examiner's
Use

21. (a) Simplify $\frac{x}{3} - \frac{4(x-2)}{5}$.

Answer (a) _____ [2]

(b) Factorise $3y^2 + 14y - 5$.

Answer (b) _____ [2]

[Turn over

22. (a) By completing the square, $x^2 - 10x + 14$ can be expressed in the form $(x + p)^2 + q$.
Find p and q .

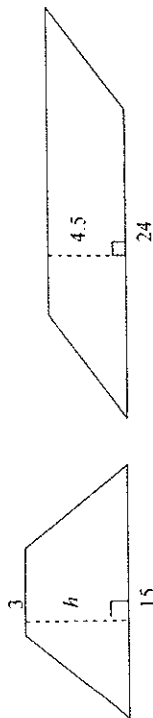
Answer (a) $p =$ _____, $q =$ _____ [2]

(b) Hence, or otherwise, solve $x^2 - 10x + 14 = 0$.
Give your answers correct to 2 decimal places.

Answer (b) $x =$ _____ or _____ [2]

[Turn over

23. The area of the trapezium is half the area of the parallelogram.
All lengths are measured in centimetres.

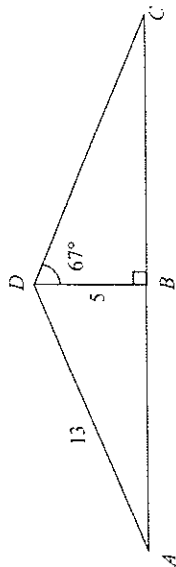


Calculate the height, h , of the trapezium.

Answer cm [3]

[Turn over]

24.



Points A , B and C are three points lying in a horizontal straight line.

BD is a vertical flagpole.

DA and DC are supporting wires.

$DA = 13$ m, $DB = 5$ m and $\angle BDC = 67^\circ$.

Calculate

(a) length AB ,

Answer (a) m [1]

(b) $\angle DAB$,

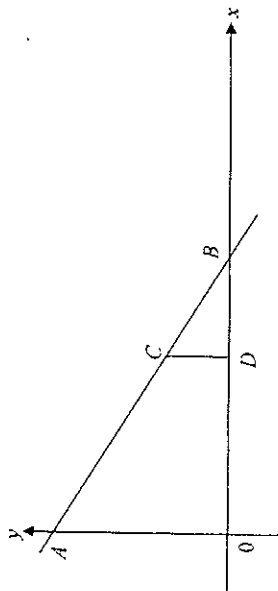
Answer (b) $^\circ$ [2]

(c) length CD .

Answer (c) m [2]

[Turn over]

25. In the diagram, the coordinates A and C are $(0, 6)$ and $(5, 2)$ respectively. The line AC produced cuts the x -axis at B . D is a point on the x -axis where CD is parallel to the y -axis.



(a) Find the gradient of the line AC .

Answer (a) _____ [1]

(b) Find the equation of the line AB .

Answer (b) _____ [1]

(c) Find the coordinates of B .

Answer (c) $B = (\quad , \quad)$ [1]

(d) Calculate the area of $\triangle BCD$.

Answer (d) _____ units² [2]

[Turn over

26. $ABCD$ is a parallelogram.
Line AB is given.
 $\angle ABC = 127^\circ$ and $BC = 7$ cm.
Answer (a) (b) (c)



- (a) Complete the parallelogram. [3]
(b) Construct the perpendicular bisector of AB . [1]
(c) Construct the bisector of $\angle ABC$. [1]
(d) Given that the two bisectors meet at P , measure PA .

Answer (d) $PA =$ _____ cm [1]

END OF PAPER

Test Item	Marking Point	Mark awarded	Remarks
1	$27.19 \times 633.1 \approx \frac{30 \times 600}{0.3265} \approx \frac{0.3}{60000}$	M1 A1	Stated 'must show working'. No or wrong working, no M1 no A1.
2	$51 \times \frac{20}{60} = 17$	M1 A1	
3	$(x-7)(2x+1) = 0$ $x = 7$ or $x = -0.5$ o.e.	B1, B1	
4	$SS1 = 2.77$ Ringgits $SS700 = 1\,939$ Ringgits 2.88 Ringgits = $432 + 2.88$ = S\$150 (exact)	M1 A1	
5a	LCM = 180	B1	Do not accept in prime factorised form.
5b	$p = 2^3 \times 5^6$	B1	Accept $(2 \times 3^3)^3$
6	$15\% \times 900 + 12 \times 72 = \999	M1 A1	
7	$8 \times 1.64 - 7 \times 1.65 = 1.57$	M1 A1	
8	$P = \frac{RT}{v-b}$ $P(v-b) = RT$ $v-b = \frac{RT}{P}$ or $b = \frac{vP - RT}{P}$ or $b = \frac{RT - vP}{-P}$	M1 A1	Case sensitive.
9a	Rhombus	B1	
9b	Sum of int. angles = $(12-2) \times 180$ Each int. angle of a regular 12-gon = $\frac{(12-2) \times 180}{12} = 150^\circ$	M1 A1	

Test Item	Marking Point	Mark awarded	Remarks
10a	9 squares	B1	
10b	$2n + 1$	B1	
10c	16	B1	
11a	0.000 000 000 000 000 000 000 91 = 9.1×10^{-25}	B1	
11b	$5 \times 10^6 \times 9.1 \times 10^{-25}$ = 45.5×10^{-19} = 4.55×10^{-18}	M1 ecf A1	Accept 5 000 000 in replacement
12	$x + 5y = 0$, $3x + 2y = 13$, $x = -5y$ (substitution mtd) or $13x = 65$ (elimination mtd)	M1 A1, A1	No working, lose M1 only, still award A2.
13a	$\frac{4h}{3} \div \frac{2h^3}{27} = \frac{4h}{3} \times \frac{27}{2h^3} = \frac{18}{h^2}$ $7(2x-1) + 3(x-7)$ = $14x - 7 + 3x - 21$ = $17x - 28$	B1	No mark if $\frac{2}{1} \times \frac{9}{h^2}$
13b	$7(2x-1) + 3(x-7)$ = $14x - 7 + 3x - 21$ = $17x - 28$	M1 for either expansion A1	
14a	$8x \geq 30$ $x \geq 3.75$ o.e.	B1	No mark if 3.75
14b	$\frac{18}{y-3} = 12$ $18 = 12y - 36$ or $\frac{18}{12} = y - 3$ $12y = 54$ or $y = 4.5$	M1 A1	$y = \frac{9}{2}$ or $4\frac{1}{2}$
15a	\$200	B1	

Test Item	Marking Point	Mark awarded	Remarks
15b	(c) Company B by \$90	B1	Not penalised if did not label
16a	$360 - 102 - 225 = 33$	B1	Should use graph for (c) but since not stated, not dependent on (b) answer.
16b	$\frac{225}{360} \times 24 \times 7 = 105$ hours $= 6\ 300$ minutes	M1 A1	Must see X 7
17a	$8^{\frac{1}{3}} \quad 5^0 \quad 49^{\frac{1}{2}} \quad 4^{\frac{1}{4}}$	B1	
17b	$16^{\frac{1}{2}} \times 64^{\frac{1}{2}} = 4^x$ $4^{10} \times 4^2 = 4^x$ $x = 11$ or $2^{-30} \times 2^3 = 2^{2x}$ $x = 11\frac{1}{2}$ o.e.	M1 same base A1	Award 1 out of 2 marks if trial and error.
18a	Plan length : Actual length $1\text{ cm} : 0.25\text{ m}$ $32\text{ cm} : 8\text{ m}$ Ans: 0.32 m	B1	

Test Item	Marking Point	Mark awarded	Remarks
18b	Plan area : Actual area $(1\text{ cm})^2 : (0.25\text{ m})^2$ $900\text{ cm}^2 : 56.25\text{ m}^2$ 56.25 m^2	M1 A1	Award M1 if 562500 is seen
19a	$x^\circ = \angle DFE$ (corr. angles) $= 360 - 308$ $= 52^\circ$	M1 A1	Zero if there is no working. Zero if there is ambiguous working yet correct answer.
19b	$y^\circ = 180 - 76 - \text{their } x$ $= 52^\circ$ (int. angles) OR $y^\circ = \angle CDE$ $= 180 - 52 - 76$ (corr. Angles, CD//AB) $= 52^\circ$ OR $\angle BAD = x = 52$ $y^\circ = 180 - 76 - 52$ (angle sum of tri.) $= 52^\circ$	M1 A1	e.c.f. Lose 1 mark out of whole question if any one missing or any wrong reason.
20	$850\text{g SMALL} = \$37.70$ $1\text{g SMALL} = \$0.04435$ $1.8\text{ kg LARGE} = \$69.90$ $1\text{g LARGE} = \$0.03883$ The large size gives the better value. OR 2 marks only if student simply $2 \times \$37.70 = \75.40 without further elaboration.	M1 M1 A1	Accept other valid comparison. Deduct 1 mark if there is some discrepancy in rounding off. Lose A1 if use the word 'big' instead.
21a	$\frac{x}{3} \quad \frac{4(x-2)}{5}$ $= \frac{5x}{15} \quad \frac{12(x-2)}{15}$ or $\frac{5x}{15} \quad \frac{3(4x-8)}{15}$ $= \frac{7x+24}{15}$ o.e.	M1 A1	
21b	$3y^2 + 14y - 5 = (3y-1)(y+5)$	B2	Lose 1 mark if candidate

Test Item	Marking Point	Mark awarded	Remarks
		OR M1 for cross method working and A1 for answer.	solved for y instead. 0 mark if $(y - \frac{1}{3})(y + 5)$
22a	$x^2 - 10x + 14$ $= x^2 - 10x + 5^2 - 5^2 + 14$ $= (x - 5)^2 - 11$ $p = -5, q = -11$	M1 A1	Acceptable if student assumed it is an equation but $(x - 5)^2 - 11$ must be seen to be awarded the M1
22b	$x^2 - 10x + 14 = 0$ $(x - 5)^2 - 11 = 0$ $(x - 5)^2 = 11$ $x - 5 = \pm\sqrt{11}$ ----- $x = 8.32$ or 1.68	M1 A1	Stated 'Hence or otherwise' If without $\pm$ but both answers correct, deduct 1 out of 2 marks.
23	$\frac{1}{2} \times (3 + 15) \times h = \frac{1}{2} \times 4.5 \times 24$ $h = 6$	M1 for LHS M1 for RHS A1	
24a	$AB = \sqrt{13^2 - 5^2}$ $= 12$	B1	
24b	$\sin \angle DAB = \frac{5}{13}$ or $\cos \angle DAB = \frac{12}{13}$ or $\tan \angle DAB = \frac{5}{12}$ $\angle DAB = 22.6^\circ$ (to 1 d.p.)	M1 (ecf for using AB)	
24c	$\cos 67^\circ = \frac{5}{CD}$ $CD = 12.8$ (to 3 s.f.)	A1 M1 A1	

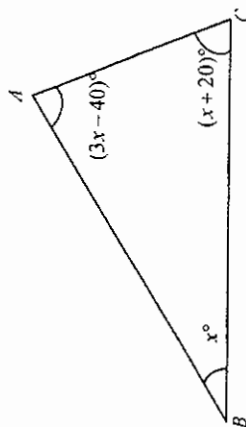
Test Item	Marking Point	Mark awarded	Remarks
25a	Gradient of the line $AC = \frac{6-2}{0-5} = -0.8$ o.e.	B1	
25b	$y = -0.8x + 6$ or $5y + 4x = 30$ o.e.	B1	
25c	$B = (7.5, 0)$	B1	
25d	$\frac{1}{2} \times 2.5 \times 2$ or $\frac{1}{2} \times (\text{their } x\text{-coordinate of } B - 5) \times 2$ $= 2.5$	M1 A1	Allow B2.
26	(a) Angle $ABC \approx 127^\circ$ Construction arcs at point D . Labelling of points and angle. (b) Construction of perpendicular bisector. (c) Construction of angle bisector. (d) $PA \approx 11.2$ cm ± 0.1	B1 B1 B1 B1 B1 B1	Penalise only 1 out of 6 marks for not labelling at least one part.

Answer all the questions in this section.

- 1 (a) It is given that y is inversely proportional to the square of x .
 (i) When $x = 0.03$, $y = 900$, find the value of y when $x = 0.5$. [2]
 (ii) Hence, find the values of x when $y = 0.16$. [2]
 (b) Simplify $\frac{3x}{x^2 - 9} - \frac{4}{x + 3}$. [3]

- 2 A motorcycle travels for 44 km at 55 km/h.
 It then travels for 108 km at 60 km/h.
 (a) Calculate the total time, in hours, for the whole journey. [2]
 (b) Calculate the average speed, in km/h, for the whole journey. [2]

3



- (a) Write down an equation in x and solve it. State your reason clearly. [3]
 (b) Find $\angle BAC$. [1]

- 4 (a) Which of these ratios are equivalent to the ratio $x : y$?
 $x^2 : y^2$ $5x : 5y$ $\frac{1}{2y} : \frac{1}{2x}$ $x - 1 : y - 1$ [2]
 (b) The ratio of boys to girls in a group of children was 3 : 4.
 The total number of children in the group was 49.
 (i) How many girls were there? [1]
 (ii) When more girls joined the group, the ratio of boys to girls became 3 : 5.
 How many girls joined the group? [2]

[Turn over]

2

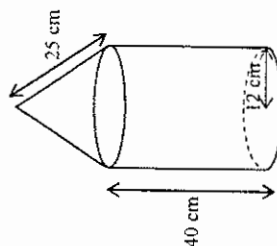
- 5 The marks for 20 students in Class 2B in their Chemistry test are shown in the stem-and-leaf diagram.

Stem	Leaf
0	8
1	3 4 9
2	0 3 7 8 8 9
3	2 2 3 4 5
4	1 2 5 7
5	0

Key 1 | 2 means 12 marks

- (a) Find
 (i) the range of the marks, [1]
 (ii) the median mark, [1]
 (iii) the mean mark. [2]
 (b) Given that one student is chosen at random from the Class 2B, calculate the probability that the student scored more than 30 marks. [1]
 (c) Kate missed the test and she sat for the test at a later date. Her teacher said that her mark would increase the range by 1 but decrease the median. Find Kate's test marks. [1]

6



- The diagram shows a container which can be modelled as a cone and a cylinder, both have a radius of 12 cm. (Take $\pi = 3.142$)
 (a) Find the height of the cone. [2]
 (b) Find the total volume of the container. [3]

[Turn over]

Section B (16 marks)

7 The distance between two towns P and Q is 35 km.

- (a) Amirah ran from P to Q at an average speed of x km/h. Write down, in terms of x , the time taken by Amirah to complete the journey. [1]
- (b) Betty ran from P to Q at an average speed which was 2 km/h faster than Amirah. Write down, in terms of x , the time taken by Betty to complete the journey. [1]
- (c) Given that the difference between the two times was 20 minutes, write down an equation in x and show that it reduces to $x^2 + 2x - 210 = 0$. [3]
- (d) Solve the equation $x^2 + 2x - 210 = 0$, giving your answers correct to 1 decimal place. [3]

8 Mandy intends to buy a car. The cash price of a car is \$128 000. She can pay for the car either through Scheme A or Scheme B .

- (a) In Scheme A , she pays a down payment of \$80 000 and the balance at the end of 3 years with a simple interest rate of 5% per year. Calculate the total amount of money that Mandy needs to pay for the car. [2]
- (b) In Scheme B , she pays a down payment \$70 000 and the balance at the end of 5 years with a compound interest rate of 2.5% per year. Calculate the compound interest that Mandy needs to pay. Give your answer to the nearest cent. [3]

[Turn over

Answer any two questions from this section. Each question carries 8 marks.

- 9 (a) Answer the whole of part (a) on lined paper. [2]

Sketch the graph of $y = (x - 3)(x + 4)$.

Do not make an accurate plot but show, on your sketch, the coordinates of the point where the graph cuts the y -axis and the coordinates of the minimum point.

- (b) Answer the whole of part (b) on a single sheet of graph paper.

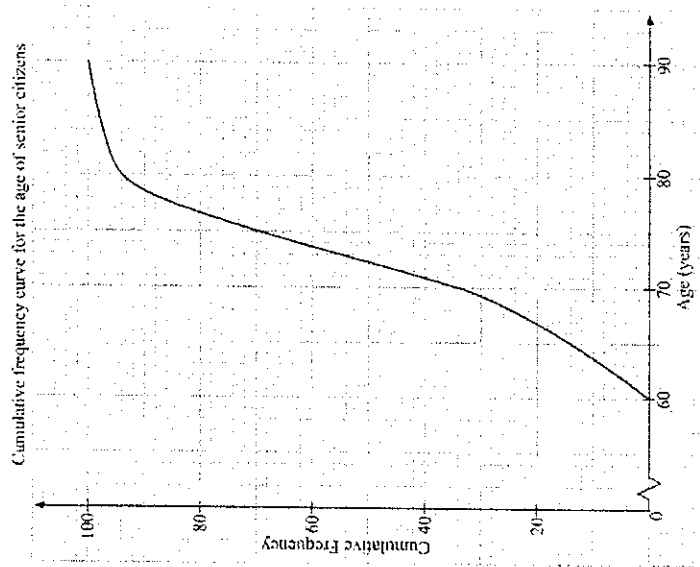
The table below is for $y = \frac{1}{8}x^3 + x - 2$ where the values of y are corrected to 1 decimal place.

x	-3	-2	-1	0	1	2	3	4
y	-8.4	-5	p	-2	-0.9	1	4.4	10

- (i) Calculate the value of p . [1]
- (ii) Draw the graph of $y = \frac{1}{8}x^3 + x - 2$ for $-3 \leq x \leq 4$. [3]
- Use a scale of 2 cm to represent 1 unit on the horizontal x -axis and a scale of 1 cm to represent 1 unit on the vertical y -axis.
- (iii) By drawing a tangent, find the gradient of the curve at $x = 2$. [2]

[Turn over

- 10 (a) The cumulative frequency curve shows the ages of 100 senior citizens living in an estate block.



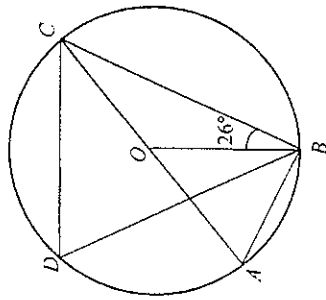
- (i) Find the range.
 (ii) Find the lower quartile.
 (iii) Find the 40th percentile.
 (iv) Find the number of senior citizens who are at least 70 years old.
 (b) The number of goals scored by soccer Team A in 6 matches are listed below.

No. of goals	2	0	1	4	5	2
--------------	---	---	---	---	---	---

- (i) Find the mean number of goals scored by Team A.
 (ii) Find the standard deviation of the number of goals scored by Team A.
 (iii) The mean and standard deviation of the number of goals scored by Team B are 3 and 1.5 respectively. Which team's performance is more consistent? Explain your answer.

[Turn over]

- 11 (a)

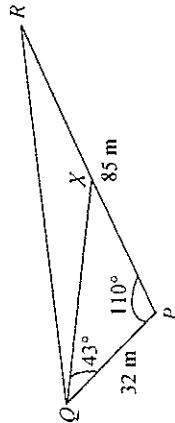


In the diagram, AOC is a diameter of the circle with centre O and $\angle OBC = 26^\circ$. Calculate, stating your reasons clearly,

- (i) $\angle ABO$,
 (ii) $\angle BDC$.

[1]
 [1]

- (b)



In the diagram, P , Q and R are three points on level ground.

$PQ = 32$ m, $\angle QPX = 43^\circ$ and $\angle RPX = 110^\circ$.

Calculate

- (i) the length of QR ,
 (ii) the length of PX ,
 (iii) the angle of elevation of pole T from point X such that RT is a vertical pole of height 54 m that stands at R

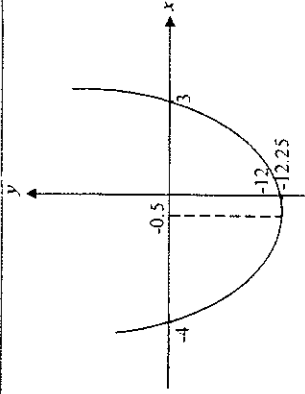
[2]
 [2]
 [2]

~ END OF PAPER ~

Marking Scheme

Test Item	Marking point	Mark Awarded	Remarks
1 (7m)	(a) (i) $y = \frac{k}{x^2}$ $900 = \frac{k}{(0.03^2)}$ $k = \frac{81}{100}$ or o.e. $y = \frac{81}{100x^2}$ $y = \frac{81}{100(0.5^2)} = 3.24$ (o.e.) (ii) $0.16 = \frac{81}{100x^2}$ (ECF) $0.16 \times 100x^2 = 81$ $x = \pm 2.25$ or $\frac{9}{4}$ (o.e.) (b) $\frac{3x}{x^2 - 9} - \frac{4}{x + 3} = \frac{3x}{(x - 3)(x + 3)} - \frac{4}{x + 3}$ $= \frac{3x - 4(x - 3)}{(x - 3)(x + 3)}$ $= \frac{3x - 4x + 12}{(x - 3)(x + 3)}$ $= \frac{12 - x}{(x - 3)(x + 3)}$	M1 A1 M1 A1 M1 A1	If did not factorise in the first step, no mark.
2 (4m)	(a) Time taken = $\frac{44}{55} + \frac{108}{60}$ $= \frac{13}{5}$ h or 2.6 hours (b) Average Speed = $\frac{44 + 108}{\frac{13}{5}}$ ≈ 58.5 km/h	M1 A1 M1 A1	No A1 if ans given in h and min
3 (4m)	(a) $x + 3x - 40 = x + 20 = 180$ ($\angle$ sum of Δ) $5x - 40 = 180$ $x = 40$ (b) $\angle BAC = 80^\circ$	M1 M1 A1 B1	If no/wrong reason given, -1 m from whole qt.

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4 (5m)	(a) $5x : 5y$ $\frac{1}{2y} : \frac{1}{2x}$ (b)(i) No. of girls = $\frac{4}{7} \times 49 = 28$ (ii) Let the number of girls added be x. $\frac{28+x}{49+x} = \frac{5}{8}$ $8(28+x) = 5(49+x)$ $x = 7$ OR No. of boys = $\frac{3}{7} \times 49 = 21$ Increase by 1 unit: 7 girls added	B2 B1 M1 A1	1 mark for each correct answer (If student give 3 ans and 2 correct, B1 only)
5 (6m)	(a)(i) Range = 42 marks $29 + 32$ (ii) Median = $\frac{29+32}{2} = 30.5$ marks (iii) Mean = $\frac{600}{20} = 30$ (b) 0.5 (o.e.) (c) Original range = $50 - 8 = 42$ marks New range (with Kate) = 43 marks → Kate can be only be the lowest in class Median = (10^{th} & 11^{th} position) = 30.5 New median = 11^{th} position = 29 (decrease) → Kate's marks = 7 marks	B2 B1 B1 B2 B1 B1	
6 (5m)	(a) Height of the cone $= \sqrt{25^2 - 12^2}$ ≈ 21.932 ≈ 21.9 cm (b) Volume of cone $= \left[\frac{1}{3} \times 3.142 \times 12^2 \times 21.932 \right]$ ≈ 3307.70 (ECF) Volume of cylinder $= 3.142 \times 12^2 \times 40$ ≈ 18097.92 Volume of container $\approx 3307.70 + 18097.92$ $\approx 21400 \text{ cm}^3$	M1 A1 M1 M1 A1	M1: For any 1 correct volume
7 (8m)	(a) $\frac{35}{x}$ (b) $\frac{35}{x+2}$	B1 B1	

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	(c) $\frac{35}{x} - \frac{35}{x+2} = \frac{20}{60}$ $\frac{35(x+2) - 35x}{x(x+2)} = \frac{1}{3}$ $\frac{70}{x(x+2)} = \frac{1}{3}$ $\frac{x(x+2)}{3} = 70$ $x^2 + 2x - 210 = 0$ (d) $x = \frac{-2 \pm \sqrt{(2)^2 - 4(1)(-210)}}{2(1)}$ $= \frac{-2 \pm \sqrt{844}}{2}$ $= 13.526$ or $= -15.526$ $= 13.5$ or $= -15.5$	M1 M1 A1 M1 A2	Accept if student reject one of the ans
8 (5m)	(a) Scheme A: $P = 128000 - 80000 = \\$48000$ $I = \frac{48000(3)(5)}{100} = \\7200 Total amount paid $= \\$80000 + \\$48000 + \\$7200 = \\135200 (b) Scheme B: $P = 128000 - 70000 = \\$58000$ $A = 58000 \left(1 + \frac{2.5}{100} \right)^5$ $= \\$65621.68$ Compound Interest = $\\$65621.68 - \\58000 $= \\$7621.68$	M1 A1 M1 M1 A1	ECF M1 if student is able to minus \$58000 to find compd interest
9(a) (8m)		G2	1m: Correct shape 1m: Correct points
9(b)	(i) $p = -3.1$ (ii) Correct points and scale (1m) Smooth curve (1m) Label axes and curve (1m)	B1 G3	No mark if did not correct to 1 d.p.

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	(iii) Draw tangent. Gradient = $2.5 \pm 10\%$ (Accept 2.25 to 2.75)	M1 A1	
10	(a) (i) Range = $90 - 60 = 30$ years (ii) Total number of observations, $N = 100$ $\therefore \frac{N}{4} = 25$ From the graph, lower quartile, $Q_1 = 68$ years (iii) 40th percentile = 71 (iv) From the graph, number of senior citizens who are less than 70 years old = 34 $\therefore$ number of senior citizens who are at least 70 years old = $100 - 34 = 66$ (b) (i) Mean number of goals for team A $= \frac{2+0+1+4+5+2}{6}$ $= \frac{14}{6} = \frac{7}{3}$ or 2.33 (3s.f.) (ii) Standard deviation for team A $= 1.70$ goals (correct to 3 sig. fig.) (iii) Since the standard deviation of the number of goals scored by team B is lower, the performance of team B is more consistent.	B1 B1 B1 B2 B1	If no/wrong reason given, -1 m from whole qn.
11 (8m)	(a) (i) $\angle ABO = 90^\circ - 26^\circ$ ($\angle$ in a semicircle) $= 64^\circ$ (ii) $\angle OAB = \angle ABO$ (base $\angle$s of isos. Δ) = 64° $\angle BDC = \angle OAB$ ($\angle$s in the same segment) $= 64^\circ$ (b) (i) By the cosine rule, $QR^2 = 32^2 + 85^2 - (2 \times 32 \times 85 \times \cos 110^\circ)$ $QR \approx 100.55$ ≈ 101 m (correct to 3 sig. fig.) (ii) $\angle QXP = 180^\circ - 43^\circ - 110^\circ$ ($\angle$ sum of Δ) $= 27^\circ$ By the sine rule, $\frac{PX}{\sin 43^\circ} = \frac{32}{\sin 27^\circ}$ $PX = \frac{32}{\sin 27^\circ} \times \sin 43^\circ$ ≈ 48.071 ≈ 48.1 m (correct to 3 sig. fig.) (iii) $RX = AC - AX$	B1 B1 M1 A1 M1 A1	

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	$= 85 - 48.071$ $= 36.929 \text{ m}$ $\tan \theta = \frac{54}{36.929}$ $\theta \approx 55.6^\circ$	MI AI	