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Answer all the questions.

For
Examiner's
Use

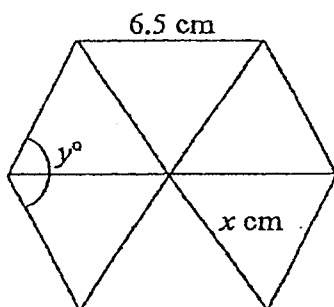
- 1 (a) Simplify $3x(2x+3)-(9x+5)$.

Answer (a) _____ [1]

- (b) Solve $x(3x+2)=4x$.

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

- 2 The diagram shows a sketch of a regular hexagon.



- (a) Write down the value of x .

Answer (a) $x =$ _____ [1]

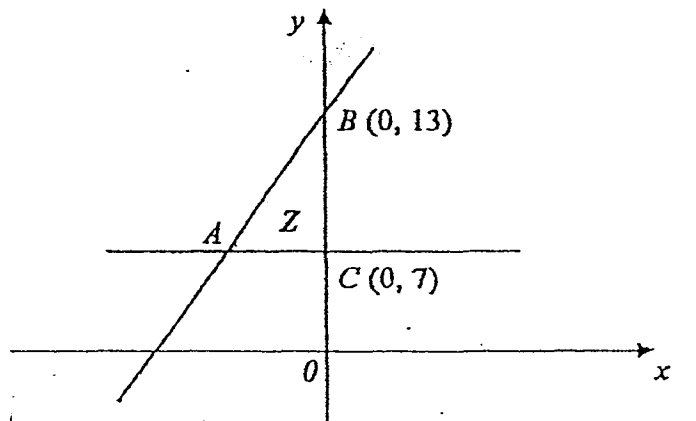
- (b) Find y .

Answer (b) $y =$ _____ [1]

[Turn over]

- 3 In the diagram, B is the point $(0, 13)$ and C is the point $(0, 7)$. The sloping line through B and horizontal line that passes through C meet at the point A .

For
Examiner's
Use



Given that the gradient of the line AB is 2, find

- (a) the equation of the line AB ,

Answer (a) _____ [1]

- (b) the coordinates of the point A ,

Answer (b) A (_____ , _____) [1]

- (c) the area of region Z , which is bounded by the y -axis, the horizontal line and the sloping line.

Answer (c) _____ units² [1]

- 4 A retailer bought some watches at \$60 per watch and sells each of them at a profit of 30%. If he earns a profit of \$2160 from selling all the watches, how many watches did he buy?

Answer _____ watches [2]

5 (a) Given that $2^{1-4x} = 81$, evaluate 2^{1-4x} .

For 441
Examiner's
Use

Answer (a) _____ [3]

(b) Simplify $2 \div \left(\frac{2}{x}\right)^{-3}$.

Answer (b) _____ [2]

6 (a) Express the numbers 198 and 264 as a product of its prime factors.

Answer (a) $198 =$ _____
 $264 =$ _____ [1]

(b) Find the largest integer which is both a factor of 198 and 264.

Answer (b) _____ [1]

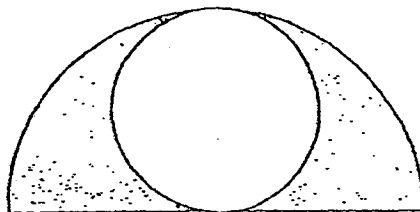
(c) Find the smallest positive integer value of n for $198n$ is a multiple of 264.

Answer (c) $n =$ _____ [1]

[Turn over

- 7 The diagram shows an inscribed circle in a semicircle. Given that the area of semicircle is 64 cm^2 , find the area of the shaded region.

For
Examiner's
Use



Answer _____ cm^2 [2]

- 8 (a) A television programme list shows that a film begins at 21 55. The film lasts for 110 minutes. At what time will it end?

Answer (a) _____ [1]

- (b) A train travelled from P to Q . The journey took $2\frac{1}{5}$ hours.

- (i) Write down, in minutes, the time taken for the journey.

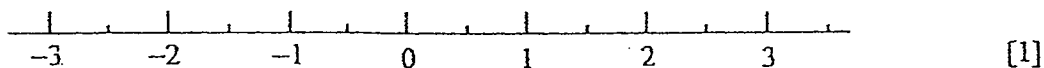
Answer (b)(i) _____ minutes [1]

- (ii) The train travelled at an average speed of 56 km/h . Calculate the distance between P and Q .

Answer (b)(ii) _____ km [1]

- 9 (a) Solve the inequality $-2 < -2x + 1 < 5$, showing your solution on the number line below.

Answer (a) _____ [1]



- (b) Hence write down the smallest integer value of x which satisfies $-2 < -2x + 1 < 5$.

Answer (b) $x =$ _____ [1]

- 10 (a) Express $x^2 - 6x - 7$ in the form $(x - a)^2 - b$.

Answer (a) _____ [1]

- (b) Hence

- (i) write down the coordinates of the turning point of $x^2 - 6x - 7$,

Answer (b)(i) (_____ , _____) [1]

- (ii) solve the equation $x^2 - 6x - 7 = 0$.

Answer (b)(ii) $x =$ _____ or _____ [1]

[Turn over

- 11 A sum of money is shared by Ann, John and Tim in the ratio 5 : 9 : 7. Tim gets \$12 more than Ann. How much money did John have?

For
Examiner's
Use

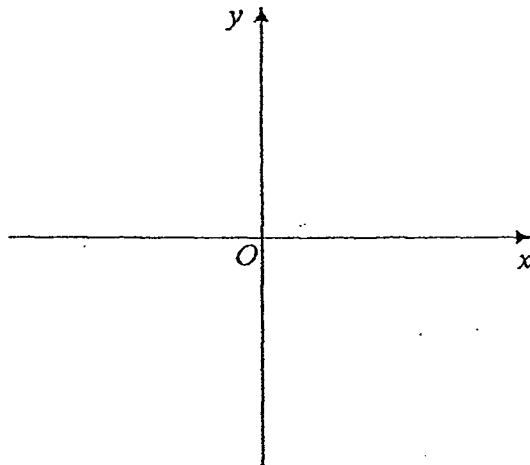
Answer \$ _____ [2]

- 12 Sketch the graph of $y = p - x^q$ in the answer space provided, showing clearly the intercepts where applicable, if

(a) $p = 2$ and $q = 1$,

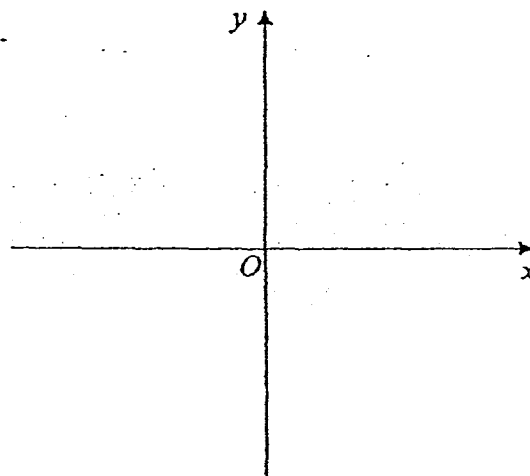
(b) $p = 1$ and $q = -2$.

Answer (a)



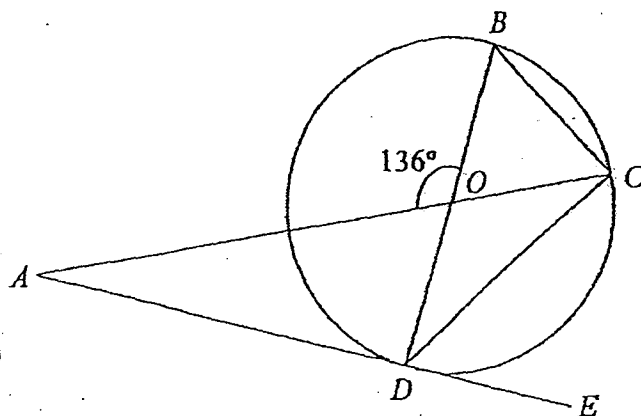
[1]

Answer (b)



[1]

- 13 In the diagram, O is the centre of the circle. The tangent to the circle at D meets CO produced at A and $\angle AOB = 136^\circ$.



Stating your reasons clearly, calculate

- (a) $\angle ACD$,

Answer (a) _____ $^\circ$ [1]

- (b) $\angle DBC$,

Answer (b) _____ $^\circ$ [1]

- (c) $\angle CAD$.

Answer (c) _____ $^\circ$ [1]

- 14 A cylinder has radius, r cm and height, h cm. Given that the radius of the cylinder decreases by 5% while the height remains the same, find the percentage decrease in the volume of the new cylinder to that of the original volume.

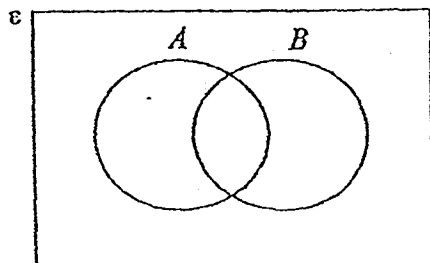
Answer _____ % [2]

[Turn over

- (a) The sets A and B are shown on the Venn Diagram. The element y is such that $y \in A$ and $y \notin B$.

On the diagram, shade the region that could represent y .

Answer (a)



[1]

- (b) $\varepsilon = \{x : x \text{ is an integer } 1 < x < 15\}$
 $P = \{x : x \text{ is an even number}\}$
 $Q = \{x : x \text{ is a multiple of } 5\}$

- (i) Find $n(P \cup Q)$.

Answer (b)(i) _____ [1]

- (ii) List the element(s) of $P' \cap Q$.

Answer (b)(ii) _____ [1]

- 16 (a) Factorise completely $x^3 - x^2y - xy^2 + y^3$.

Answer (a) _____ [2]

- (b) Factorise $(m-2n)^2 - 9m^2$.

Answer (b) _____ [2]

- 17 The types and number of admission tickets sold at three tourist attractions from 10 a.m. to 12 p.m. for Monday and Tuesday of a particular week are shown below.

Tourist Attractions	Monday		Tuesday	
	Adult	Child	Adult	Child
Jurong Bird Park	20	12	18	5
Singapore Flyer	12	5	16	5
Singapore Zoo	25	31	28	36

The information for Monday's sales can be represented by the matrix $M = \begin{pmatrix} 20 & 12 \\ 12 & 5 \\ 25 & 31 \end{pmatrix}$.

- (a) Write down the matrix T where T represents the information for Tuesday's sales.

Answer (a) _____ [1]

- (b) If $B = M + T$, find B .

Answer (b) _____ [1]

- (c) For each of the three tourist attractions, an adult ticket costs \$20 while a child ticket costs \$10. Given that $P = \begin{pmatrix} 20 \\ 10 \end{pmatrix}$, find A where $A = BP$.

Answer (c) _____ [1]

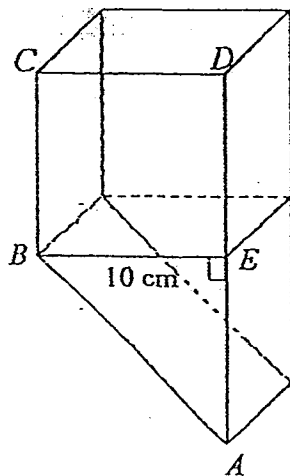
- (d) Describe what is represented by the elements of A .

Answer (d) _____

_____ [1]

[Turn over

- 18 The diagram shows a container made up of a cube and a right-angled triangular prism. Each side of the cube is 10 cm and $EB = EA$.



(a) Calculate

- (i) the area of trapezium $ABCD$,

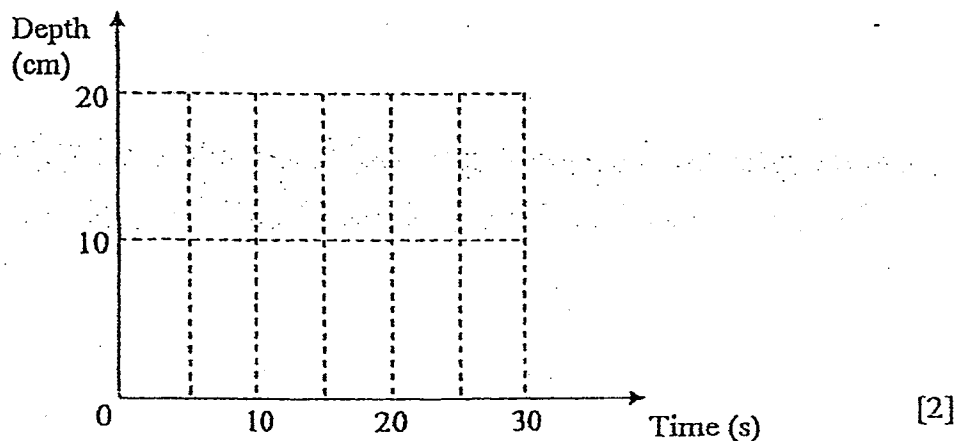
Answer (a)(i) _____ cm^2 [1]

- (ii) the volume of the container.

Answer (a)(ii) _____ cm^3 [1]

- (b) Water is poured in at a constant rate and fills the container in 30 s. On the diagram in the answer space, sketch the graph showing how the depth of the water in the container varies with time.

Answer (b)



19 (a) Simplify $\left(\frac{3a^2}{b^{\frac{1}{2}}}\right)^3 \times \frac{b^{-2}}{6a^6}$.

Answer (a) _____ [2]

(b) Write as a single fraction in its simplest form $\frac{x-1}{2-x} - \frac{3x}{2x-4}$.

Answer (b) _____ [2]

20 Singapore has a population of 5.399 million and a total land area of 682.7 km².

(a) Express the population of Singapore in standard form.

Answer (a) _____ [1]

(b) Calculate the average number of people living per square kilometre in Singapore, leaving your answer correct to 2 significant figures.

Answer (b) _____ people/km² [1]

(c) If 23% of Singapore's total land area is made up of nature reserve, find the actual area of the nature reserve in square metres.

Answer (c) _____ m² [2]

[Turn over]

- 21 Solve the simultaneous equations.

$$3x + 5y - 5 = 0$$

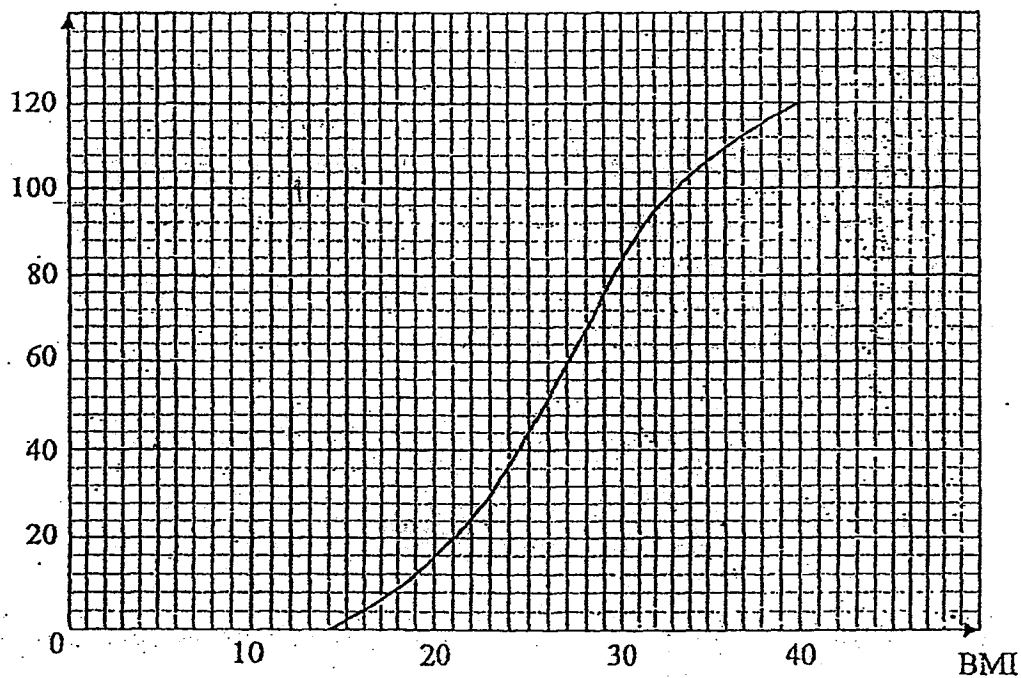
$$2y + 6x = 15$$

For
Examiner's
Use

Answer $x =$ _____ , $y =$ _____ [3]

- 22 The cumulative frequency curve shows the Body Mass Index (BMI) of a group of 120 adults in fitness programme A.

Cumulative Frequency



- (a) Use the graph to estimate
- (i) the median BMI,

Answer (a)(i) _____ [1]

(ii) the interquartile range,

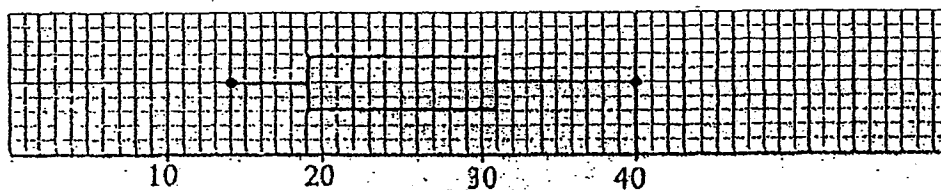
For
Examiner's
Use

Answer (a)(ii) _____ [1]

(iii) the percentage of adults whose BMI is 24 or more.

Answer (a)(iii) _____ % [1]

(b) The box-and-whisker diagram shows the BMI of another group of 120 adults in fitness programme B.



Compare and comment on the BMI of the two groups of adults.

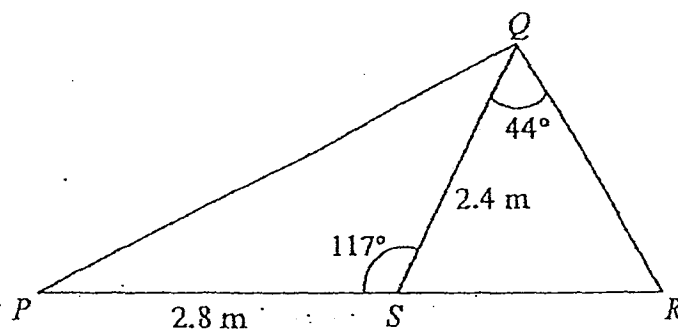
Answer (b)

[2]

[Turn over

- 23 The diagram shows some beams that support the roof of a house. PSR is a straight line, $PS = 2.8$ m, $SQ = 2.4$ m, $\angle PSQ = 117^\circ$ and $\angle SQR = 44^\circ$.

For
Examiner's
Use



(a) Calculate

(i) PQ ,

Answer (a)(i) _____ m [2]

(ii) SR .

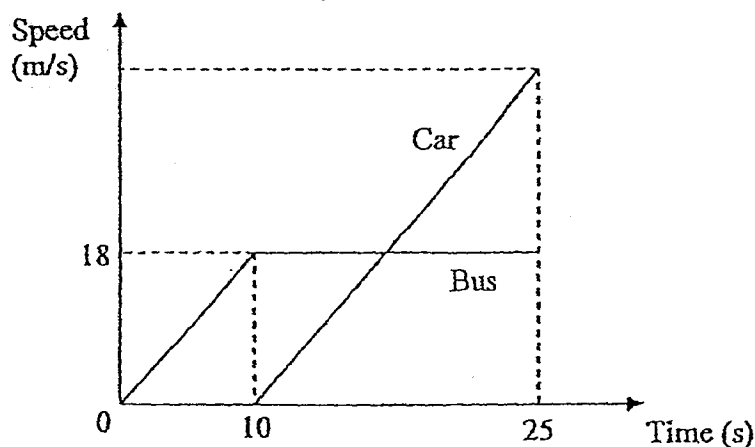
Answer (a)(ii) _____ m [2]

- (b) An extra beam is added to join the midpoint of QS to a point on QR . Calculate the length of the extra beam if it is perpendicular to QR .

Answer (b) _____ m [2]

- 24 The diagram shows the speed-time graph of a bus and a car traveling from the same place. The bus accelerates uniformly from rest to a speed of 18 m/s in 10 seconds. It then continues to travel at this constant speed.

For
Examiner's
Use



- (a) Calculate the speed of the bus after 6 seconds.

Answer (a) _____ m/s [1]

- (b) Find the distance travelled by the bus in 25 seconds.

Answer (b) _____ m [1]

- (c) The car starts 10 seconds later than the bus. It accelerates uniformly until it overtakes the bus after the bus has travelled for 25 seconds. Calculate the speed of the car at this instant.

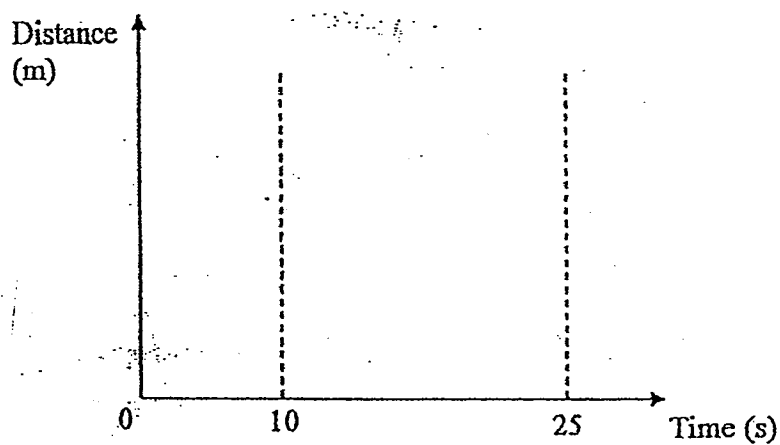
Answer (c) _____ m/s [2]

[Turn over]

- (d) On the diagram in the answer space, sketch the distance-time graph for the bus.

For
Examiner's
Use

Answer (d)



[1]

End of Paper

PLMGS

2014 Prelim Examination (2) Mathematics Paper 1

Answer Keys:

1(a) $6x^2 - 5$ (b) $x = 4$ or $x = \frac{2}{3}$

2(a) $x = 6.5$ (b) $y = 120$

3(a) $y = 2x + 13$ (b) $(-3, 7)$ (c) 9 units^2

4. 120

5(a) $\frac{1}{32}$ or 0.03125 (b) $\frac{16}{x^3}$

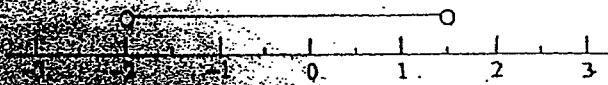
6(a) $198 = 2 \times 3^2 \times 11$, $264 = 2^3 \times 3 \times 11$ (b) 66 (d) 4

7. 32 cm^2

8(a) 23.45 (b)(i) 132 minutes (ii) $123\frac{1}{5} \text{ km}$

9(a) $-2 \leq x \leq \frac{1}{2}$

(b) $x = -1$

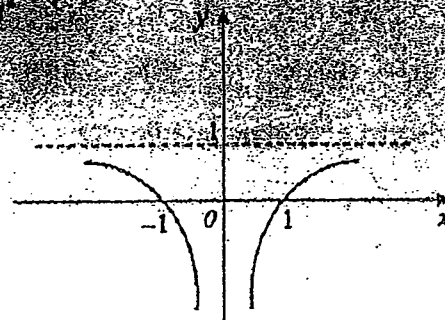
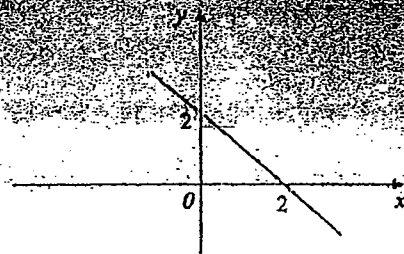


10(a) $(4-3) = 1$ (b) $(4-3) = 1$ (c) $x = 7$ or $x = -1$

11. 85

12(a) $y = x + 2$

$y = x + 2$



13(a) 22°

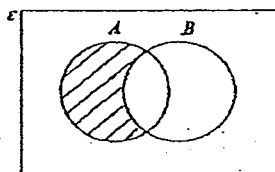
(b) 68°

(c) 46°

14. 9.75%

15(a) (b)(i) 8

(ii) $\{5\}$



16(a) $(x-y)^2(x+y)$

(b) $4(n-2m)(n+m)$ or $-4(2m-n)(n+m)$

17(a) $T = \begin{pmatrix} 18 & 5 \\ 16 & 5 \\ 28 & 36 \end{pmatrix}$

(b) $B = \begin{pmatrix} 38 & 17 \\ 28 & 10 \\ 53 & 67 \end{pmatrix}$

(c) $A = \begin{pmatrix} 930 \\ 660 \\ 1730 \end{pmatrix}$

(d) The elements represent the total sales of tickets on Saturday and Sunday for Jurong Bird Park, Singapore Flyer and Singapore Zoo respectively.

18(a)(i) 150 cm^2

(ii) 1500 cm^3

19(a) $\frac{9}{2b^4}$

(b) $\frac{5x-2}{2(2-x)}$ or $\frac{2-5x}{2(x-2)}$

20(a) 5.399×10^6

(b) 7900

(c) 157021000 m^2

21. $x = 2\frac{17}{24}$, $y = -\frac{5}{8}$

22(a)(i) 27 (ii) 8 (iii) 70%

(b) Median of Programme B = 22 and IQR of Programme B = $31 - 9 = 12$

The adults on Programme A has higher / bigger / greater / larger BMI than that of Programme B as its median is 27 while that of Programme B is 22.

The BMI of adults on Programme A is more consistent than that of Programme B as its IQR is 8 while that of Programme B is 12.

23(a)(i) 4.44 m

(ii) 1.74 m

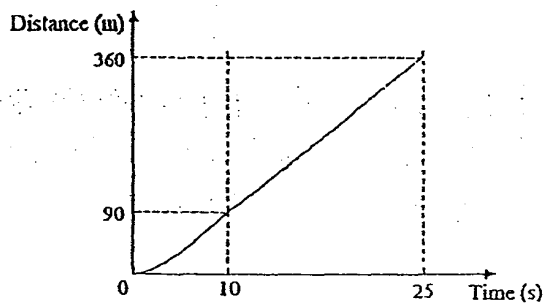
(b) 0.834 m

24(a) 10.8 m/s

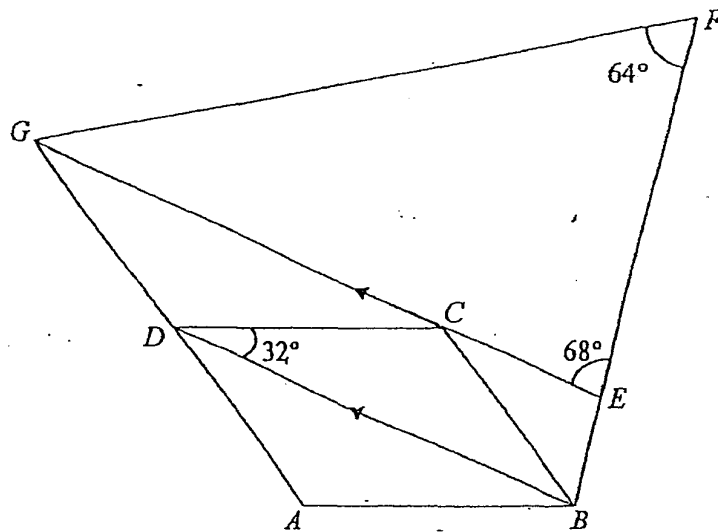
(b) 360 m

(c) 48 m/s

(d)



- 1 In the diagram, $ABCD$ is a rhombus, BEF , ADG and ECG are straight lines. BD is parallel to EG , $\angle BDC = 32^\circ$, $\angle FEG = 68^\circ$ and $\angle EFG = 64^\circ$.



(a) Find

(i) $\angle BAD$,

[1]

(ii) $\angle EBC$,

[2]

(iii) $\angle AGE$.

[1]

(b) Prove that $ABFG$ is a cyclic quadrilateral.

[2]

[Turn Over

- 2 The even numbers are arranged in a triangular array as shown below. This pattern of arrangement is to be continued.

2
 4 6
 8 10 12
 14 16 18 20
 22 24 26 28 30

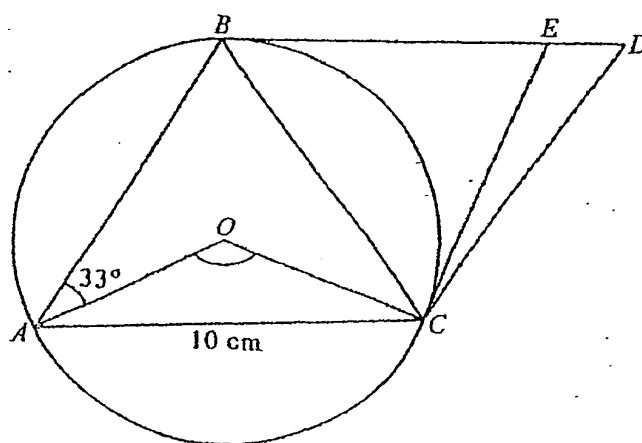
The table is based on the arrangement of numbers above.

Row No.	Sum of the first and the last numbers	Sum of all the numbers in the row	Average of all the numbers in the row
n	T	S	A
1	4	2	2
2	10	10	5
3	20	30	10
4	34	68	17
5	52	130	26
6	a	b	c

- (a) Find the values of a , b and c in the 6th row of the table. [3]
- (b) Write down a formula, in terms of n , for the average, A , of all the numbers in the row. [1]
- (c) Write down a formula, in terms of n , for the sum, S , of all the numbers in the row. [1]
- (d) Find the largest three-digit number that can be found in the A column. [1]
- (e) Write down the relationship between T and A . [1]
-

- 3 (a) Given that $ab^3 = -2$, evaluate $ab(a^3b^{11} - 2ab^3 - b)$. [2]
- (b) It is given that $x = t^2 + 1$ and $y = t + 7$.
- (i) Find the values of t for which $x = y$. [2]
- (ii) Express y in terms of x . [2]
- (c) Express $\frac{1}{m(m-2)} - \frac{3-m}{2-m}$ as a single fraction in its simplest form. [2]

- 4 In the diagram, A , B and C are three points on a circle with centre O and $ABDC$ is a parallelogram. The tangent to the circle at C meets BD at E and $\angle OAB = 33^\circ$.



- (a) Given the length of AC is 10 cm and the radius of the circle is 5.47 cm, prove that $\angle AOC$ is 132° , correct to the nearest degree. [2]
- (b) Hence show your working clearly and find
- (i) $\angle ABC$, [1]
- (ii) $\angle OAC$, [1]
- (iii) $\angle BCE$, [2]
- (iv) $\angle ECD$, [2]
- (v) the perpendicular distance from O to AC . [2]

[Turn Over]

5. Answer the whole of this question on a sheet of graph paper.

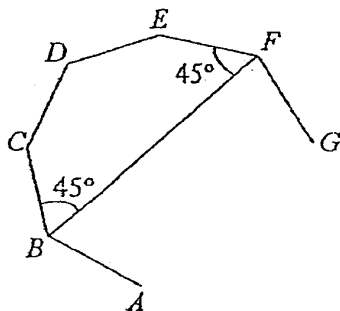
The variables x and y are connected by the equation $y = Ax^2 + Bx + 1$.

Some corresponding values of x and y are given in the table below.

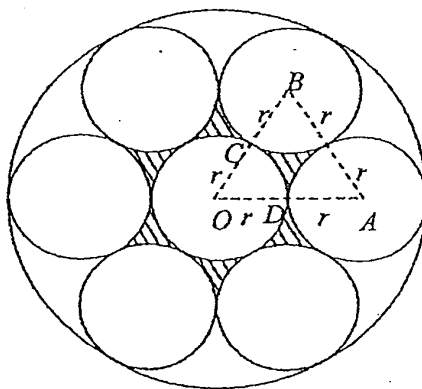
x	-1	0	1	1.5	2.5	3	5
y	-4	1	4	4.75	4.75	4	-4

- (a) Using a scale of 2 cm to represent 1 unit, draw a horizontal x -axis for $-1 \leq x \leq 5$.
Using a scale of 2 cm to represent 1 unit, draw a vertical y -axis for $-4 \leq y \leq 6$.
On your axes, plot the points given in the table and join them with a smooth curve. [3]
- (b) The points $(-0.5, k)$ and (h, k) lie on the curve.
Use your graph to find
- (i) the value of k , [1]
- (ii) the value of h . [1]
- (c) By drawing a tangent, find the gradient of the curve at $x = 2.5$. [2]
- (d) The line $y = t$ is a tangent to the curve $y = Ax^2 + Bx + 1$.
Find the value of t . [1]
- (e) The line $y = -x + 2$ intersects the curve $y = Ax^2 + Bx + 1$.
- (i) On the same axes, draw the graph of $y = -x + 2$. [1]
- (ii) Using your graphs, find the value of x in the range $-1 \leq x \leq 5$ for which $Ax^2 + (B+1)x - 1 \leq 0$. [2]

- 6 (a) The exterior angles of an irregular hexagon are in the ratio $1 : 3 : 2 : 3 : 5 : 1$. Calculate the smallest interior angle of this hexagon. 461
[2]
- (b) $ABCDEF$ is a part of a regular n -sided polygon and $\angle CBF = \angle EFB = 45^\circ$. Find n . [2]



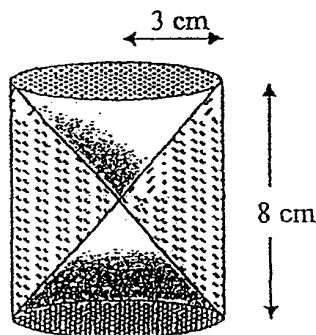
- (c) The diagram shows seven small circles, each with the same radius r cm, enclosed within a larger circle. The small circle in the middle, centre O , touches the other six small circles. These six small circles each touch three small circles and the large circle, the centre of which is also O . O , A and B are the centres of three of the small circles.



- (i) Show that the height of $\triangle OAB$ is $\sqrt{3}r$ cm, given that its base is $2r$ cm. [2]
- (ii) Given that the radius of each of the small circles is 5 cm, calculate the area of $\triangle OAB$. [1]
- (iii) Find the area of sector OCD . [2]
- (iv) Hence find the shaded area. [2]

[Turn Over]

- 7 (a) A container, which is a right circular cylinder, with a radius of 3 cm and height 8 cm, contains two identical solid cones as shown. The space between the cylinder and cones is filled with water.



Calculate

- (i) the volume of the cylinder, [1]
 - (ii) the volume of the two cones, [1]
 - (iii) the volume of the water, [1]
 - (iv) the total surface area of the container that is in contact with the water. [2]
- (b) In October 2013, Larrinna changed 1725 Thai Baht into Singapore Dollars when the rate of exchange was x Thai Baht = S\$1.
- In December 2013, Larrinna again changed 1725 Thai Baht into Singapore Dollars. The rate of exchange was then $(x + 2)$ Thai Baht = S\$1.
- (i) Write down two expressions, in terms of x , for the number of Singapore Dollars that Larrinna received in October and December respectively. [2]
 - (ii) Given that Larrinna received S\$6 less in December than what she received in October, form an equation in x and show that it reduces to $x^2 + 2x - 575 = 0$. [2]
 - (iii) Solve this equation to find the rate of exchange in December 2013. [2]

- 8 In December 2013, Matthea was interested to buy a newly launched shoebox flat that costs \$150 000. She planned to take a loan from a bank to pay for the flat.

The table shows the monthly repayment plan (per \$1000 borrowed) based on the expected interest rates, offered by PLMGS bank.

MONTHLY REPAYMENT TABLE						
Principal and Interest to be paid per \$1000 borrowed						
Interest Rate (per annum)	Term of Loan (years)					
	5	10	15	20	25	30
6.5%	\$19.57	\$11.35	\$8.71	\$7.46	\$6.75	\$6.32
7.0%	\$19.80	\$11.61	\$8.99	\$7.75	\$7.07	\$6.65

- (a) In 2014, the interest rate per annum for Matthea's housing loan would be 7%. Calculate the monthly repayment if Matthea borrowed \$150 000 over a period of 20 years in 2014. [2]
- (b) Calculate the interest that Matthea has to pay. [2]
- (c) Matthea calculated that if she repaid the loan over 15 years, her total repayment to the bank would be less. Based on a 15-year loan period, calculate
- (i) Matthea's monthly repayment, [1]
- (ii) the interest that Matthea has to pay, [2]
- (iii) the interest that Matthea would save by repaying the loan over 15 years instead of 20 years. [1]
- (d) Matthea's mother wanted to help her pay for the flat. She offered to give Matthea all the money she had invested in the bank to help her buy the flat.

Matthea's mother deposited \$40 000 in the bank on 2 January 2011. The bank paid simple interest at the rate of 5% per year. Matthea's mother withdrew all the money from the bank on 2 January 2014.

- (i) Calculate the amount of money that Matthea's mother would withdraw from the bank on 2 January 2014. [2]

The flat appreciated in value by 6% just before Matthea bought it in January 2014.

Calculate

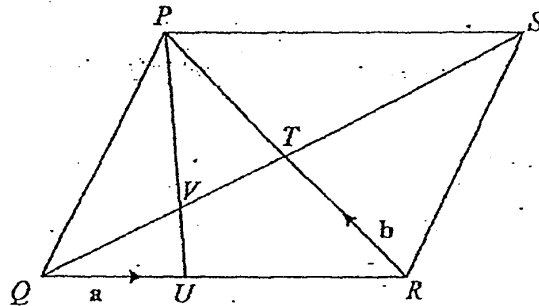
- (ii) the cost of the flat, [1]
- (iii) the amount of money that Matthea needed to borrow from the bank to pay for the flat. [1]

[Turn Over]

- 9 (a) The points P , Q and R have position vectors $\mathbf{p} = \begin{pmatrix} 5 \\ -3 \end{pmatrix}$, $\mathbf{q} = \begin{pmatrix} 2 \\ 5 \end{pmatrix}$ and $\mathbf{r} = \begin{pmatrix} -6 \\ k \end{pmatrix}$ respectively.

- (i) Find the positive value of k for which $|\overrightarrow{RQ}| = 10$ units. [2]
- (ii) Write down the coordinates of point M where $\overrightarrow{PM} = 3\overrightarrow{QM}$. [2]

- (b) In the diagram, $PQRS$ is a parallelogram. The diagonals PR and QS intersect at T . U is a point on QR such that $QR = 3QU$. V is the midpoint of QT , $\overrightarrow{QU} = \mathbf{a}$ and $\overrightarrow{RT} = \mathbf{b}$.



- (i) Express, as simply as possible, in terms of $\mathbf{a}$ and $\mathbf{b}$,
- (a) $\overrightarrow{QV}$, [1]
- (b) $\overrightarrow{QP}$. [1]
- (ii) Show that $\overrightarrow{PV} = -\frac{3}{2}(\mathbf{a} + \mathbf{b})$. [1]
- (iii) Express $\overrightarrow{PU}$ as simply as possible, in terms of $\mathbf{a}$ and $\mathbf{b}$. Hence show that PV produced meets QR at U . [2]
- (iv) Calculate the value of
- (a) $\frac{PV}{VU}$, [1]
- (b) $\frac{\text{area of } \triangle PVT}{\text{area of } \triangle PQU}$, [1]
- (c) $\frac{\text{area of } \triangle PQU}{\text{area of parallelogram } PQRS}$ [1]

- 10 (a) One day, a farmer collected 340 eggs from his hens.
The table shows the cumulative frequency of the mass of the eggs.

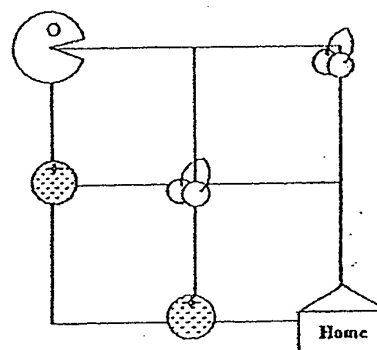
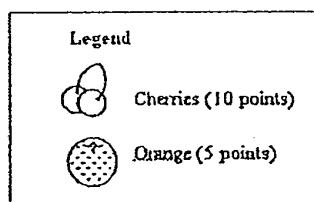
Mass (m grams)	≤ 34	≤ 42	≤ 46	≤ 48	≤ 50	≤ 54	≤ 58	≤ 66
Cumulative Frequency	0	40	100	140	188	260	316	340

- (i) Copy the table and write down the distribution of the mass of the eggs. [2]

Mass (m grams)	$34 < m \leq 42$	$42 < m \leq 46$	$46 < m \leq 48$	$48 < m \leq 50$
Frequency				

Mass (m grams)	$50 < m \leq 54$	$54 < m \leq 58$	$58 < m \leq 66$
Frequency			

- (ii) Find the mean and standard deviation of the mass of the eggs. [3]
- (iii) Several days later, it was noticed that the weighing machine had been wrongly calibrated, and that all masses should be 3 grams less. State what adjustment, if any, should be made to your results for part (a)(ii) in order to give the correct value of mean and standard deviation of the mass of the eggs. [2]
- (b) The picture on the right shows the formation as seen on the screen of a popular computer game, Pacman.



At each junction, Pacman can only move down or right, until it reaches Home.
The probability of it taking either path is equal.

- (i) What is the probability that Pacman would score a total of 15 points before reaching Home? [2]
- (ii) Calculate the highest possible score. [1]
- (iii) What is the probability of hitting the highest score? [2]

End of Paper

PLMGS

2014 Prelim Examination (2) Mathematics Paper 2

Answer Keys:

- 1(a)(i) 116° (ii) 36° (iii) 32°
 (b) $\angle BAD + \angle EFG = 116^\circ + 64^\circ = 180^\circ$
 Hence ABFG is a cyclic quadrilateral,
 as $\angle BAD + \angle EFG = 180^\circ$ (angles in opposite segments are supplementary)
- 2(a) $a = 74, b = 222, c = 37$ (b) $A = n^2 + 1$ (c) $S = n(n^2 + 1)$
 (d) 962 (e) $T = 2A$
- 3(a) 58 (b)(i) $t = -2$ or 3 (ii) $y = \pm\sqrt{x-1} + 7$
 (d) $\frac{-m^2 + 3m + 1}{m(m-2)}$
- 4(b)(i) 66° (ii) 24° (iii) 57° (iv) 9° (v) $2.22 / 2.23 \text{ cm}$
- 5(b)(i) $k = -1.5$ (ii) $h = 4.55$ (c) 1 (d) $t = 5$
 (e)(ii) $-1 \leq x \leq 0.25$ and $4.8 \leq x \leq 5.0$
- 6(a) 60° (b) $n = 12$ (c)(ii) 43.1 cm^2 (iii) 13.1 cm^2
 (iv) 24.2 cm^2
- 7(a)(i) 226 cm^3 (ii) 75.4 cm^3 (iii) 151 cm^3 (iv) 245 cm^3
 (b)(i) October: S\$ $\left(\frac{1725}{x}\right)$ and December: S\$ $\left(\frac{1725}{x+2}\right)$
 (ii) $\frac{1725}{x} - \frac{1725}{x+2} = 6$ (iii) $x = 21, \text{ S\$}1 = 25 \text{ Thai Baht}$
- 8(a) \$1162.50 (b) \$129 000
 (c)(i) \$1348.50 (ii) \$92 730 (iii) \$16 270
 (d)(i) \$46 000 (ii) \$159 000 (iii) \$113 000
- 9(a)(i) $k = 11$ (ii) M (0.5, 9)
 (b)(i)(a) $\frac{1}{2}(b + 3a)$ (b) $3a + 2b$ (b)(iii) $-2(a + b)$
 (b)(iv)(a) 3 (b) $\frac{3}{4}$ (c) $\frac{1}{6}$
- 10(a)(i) 40, 60, 40, 48, 72, 56, 24 (ii) mean = 49.3 g and SD = 6.40 g
 (iii) -3 g from mean, no adjustment to SD
 (b)(i) $\frac{1}{4}$ (ii) 20 (iii) $\frac{1}{8}$