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Calculator Model:
(if applicable)



Paya Lebar Methodist Girls' School (Secondary)
Preparatory Examination 2016
Secondary 4 Express

Name: _____ ()

Class: _____

MATHEMATICS

4048/01

Paper 1

12 May 2016

Candidates answer on the Question Paper.

2 hours

READ THESE INSTRUCTIONS FIRST

Write your name, index number and class on all the work you hand in.

Write in dark blue or black pen.

You may use a HB pencil for any diagrams or graphs.

Do not use paper clips, highlighters, glue or correction fluid.

Answer **all** questions.

If working is needed for any question, it must be shown **with** the answer.

Omission of essential working will result in a loss of marks.

The use of an approved scientific calculator is expected, where appropriate.

If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.

For π , use either your calculator value or 3.142, unless the question requires the answer in terms of π .

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

The total of the marks for this paper is 80.

My Target is:

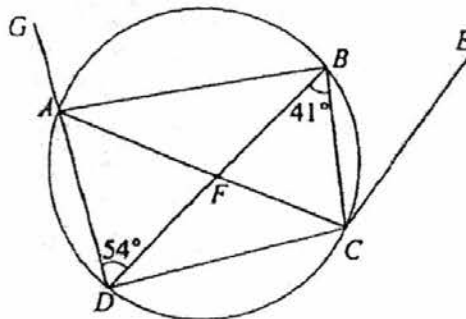
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80

Answer all the questions.

- 1 A path along Pasir Ris Park is 12 km long.
- Darryl walks at an average speed of x km/h. Write down an expression, in terms of x , for the number of hours he takes to walk the entire path. [1]
 - Oliver walks at an average speed of $(x + 0.5)$ km/h. Write down an expression, in terms of x , for the number of hours he takes to walk the entire path. [1]
 - Darryl takes 10 minutes longer than Oliver to walk the entire path. Write down an equation in x , and show that it simplifies to $2x^2 + x - 72 = 0$. [2]
 - Solve the equation $2x^2 + x - 72 = 0$, giving the solutions correct to 3 decimal places. [3]
 - Oliver and Darryl took part in a 30 km relay walkathon, where each of them walked half the distance at the average speed stated in (a) and (b). Find the total time taken by them to complete the walkathon. [2]

- 2 In the diagram, AC is a diameter of the circle $ABCD$. AC and BD cut at F . DAG is a straight line. Angle $ADB = 54^\circ$ and angle $DBC = 41^\circ$.



- Calculate, stating your reasons clearly,
 - $\angle BCF$, [1]
 - $\angle BFC$, [1]
 - $\angle BAC$, [1]
 - $\angle BAG$. [2]
- It is given that BD is parallel to CE . Lily says that CE is a tangent to the circle at point C . Explain, with calculations, why Lily is not correct. [1]

- 3 (a) The number of hours of sleep per night of a group of girls is recorded in the table shown below.

Number of hours	4	5	6	7	8	9
Frequency	5	6	7	2	x	6

- (i) Given that the median is 6, find the largest possible value of x . [1]
- (ii) With the value of x found in (i), calculate
- (a) the mean number of hours of sleep, [1]
- (b) the standard deviation. [1]
- (iii) The number of hours of sleep per night of a group of boys is summarised below.

Mean	5.75
Standard Deviation	2.31

Make two comparisons between the number of hours of sleep per night by the two groups, using your answer found in (ii). [2]

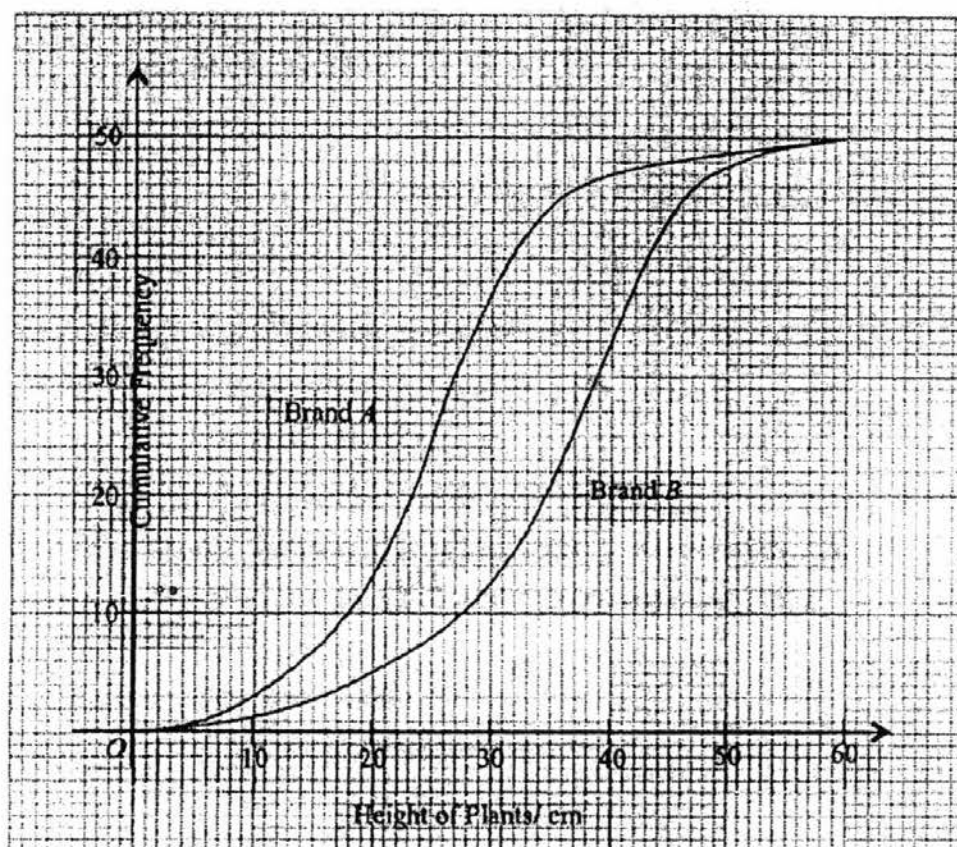
- (b) A basket contains identical Easter eggs which are painted either blue or red in colour. There are 8 blue eggs and 3 red eggs.

An egg is picked out at random and not replaced.

A second egg is picked out at random and not replaced.

- (i) Find, as a fraction in its simplest form, the probability that
- (a) the first egg taken is red, [1]
- (b) the second egg is blue, given that the first egg is blue, [1]
- (c) one egg is red and the other is blue. [2]
- (ii) Some green eggs are added to the basket and two eggs are picked out at random. Given that the probability that no green eggs are picked is $\frac{11}{21}$, calculate the number of green eggs added. [3]

- 4 The diagram below is the cumulative frequency curve for the heights, in cm, of two batches of plants each of which was given Brand *A* and Brand *B* fertilizer – respectively.



- (a) Use the graph for Brand *A* to estimate
- (i) the median, [1]
 - (ii) the interquartile range, [2]
 - (iii) the number of plants whose heights are more than 36 cm. [1]
- (b) A plant is measured to be 24 cm tall with Brand *A* fertilizer. Use the two graphs to estimate this plant's height if it had been given Brand *B* fertilizer. [1]
- (c) State, with a reason, which you think is the better fertilizer. [1]

[Turn Over

- 5 (a) A is the point $(3, -2)$, B is the point $(9, 6)$.

(i) Write down the column vector $\overrightarrow{AB}$. [1]

(ii) Calculate the value of $|\overrightarrow{AB}|$. [2]

(iii) D is a point such that $\overrightarrow{AD} = 5\overrightarrow{BA}$. Find the coordinates of D . [2]

- (b) The table below shows the number of tubs of ice-cream of three flavours, sold at three shops.

	Vanilla	Chocolate	Strawberry
Moo	5	3	2
Cool	11	8	6
Icez	8	5	4

The cost price of a tub of Vanilla, Chocolate and Strawberry ice-cream is \$20, \$18 and \$15 respectively.

The cost is represented by the matrix $B = \begin{pmatrix} 20 \\ 18 \\ 15 \end{pmatrix}$.

(i) Write down a 3×3 matrix A that represents the data in the table above. [1]

(ii) Given that $P = AB$, evaluate P . [1]

(iii) Explain what the elements in P represent. [1]

Moo makes a profit of 10%, Cool makes a profit of 15% and Icez makes a profit of 20%.

(iv) Write down a matrix C given that the product CP gives the profit that each shop earns. [1]

(v) Evaluate the matrix CP . [1]

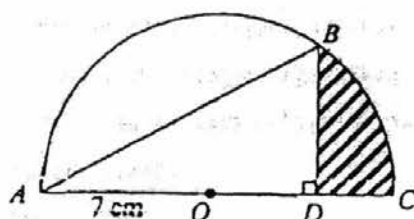
- 6 (a) Solve the inequality $\frac{x-1}{5} \geq \frac{3-x}{2}$. [2]

(b) Express as a single fraction in its simplest form

$$\frac{3}{2x-1} + \frac{1}{1-3x} + \frac{1}{6x^2-5x+1}. \quad [4]$$

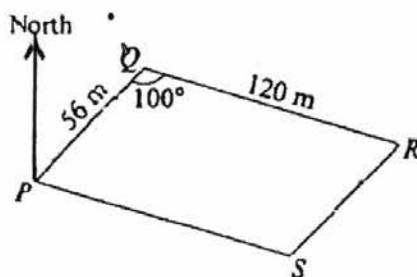
(c) Given that $xy^2 + x^2 - 1 = x^2y^2 + 3y^2 - 3xy^2$, express y in terms of x . [4]

- 7 In the diagram, $OABC$ is a semi-circle, with centre O and radius 7 cm. The length of the arc BC is 5.24 cm.



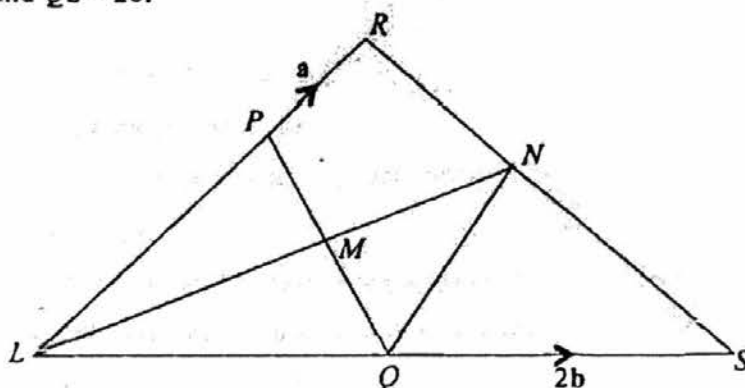
B is a point on the arc AC . The perpendicular from B to AC meets AC at D .

- (i) Find angle BOC in radians, giving your answer correct to 3 significant figures. [2]
 - (ii) Find the length of BD . [2]
 - (iii) Show that the length OD is approximately 5.13 cm. [1]
 - (iv) Find the area of the shaded region. [2]
- 8 The diagram shows P , Q , R and S , the four corners of a horizontal field $PQRS$. $PQRS$ is a parallelogram. The corner Q is 56 metres from P on a bearing of 034° , angle PQR is 100° and R is 120 metres from Q .



- (a) Calculate
 - (i) the bearing of R from Q , [2]
 - (ii) the length PR , [2]
 - (iii) the area of the field $PQRS$, [2]
 - (iv) angle QPR . [2]
- (b) An eagle was hovering at a height of 35 metres above the field. It spots its prey on the ground at an angle of depression of 58° . Calculate the distance that the eagle must fly to catch its prey. [2]

- 9 In the triangle LRS , the point P on LR is such that $RL = 3RP$. Q is the midpoint of LS and M is the midpoint of PQ . LM produced meets RS at N and $5LM = 7MN$.
 $\overrightarrow{PR} = \mathbf{a}$ and $\overrightarrow{QS} = 2\mathbf{b}$.



- (a) Express each of the following, as simply as possible, in terms of $\mathbf{a}$ and/or $\mathbf{b}$,
- $\overrightarrow{PQ}$, [1]
 - $\overrightarrow{RS}$, [1]
 - $\overrightarrow{LM}$. [2]
- (b) Show that $\overrightarrow{RN} = \frac{1}{7}(-9\mathbf{a} + 12\mathbf{b})$. [1]
- (c) Calculate the value of
- $\frac{RN}{NS}$, [1]
 - $\frac{\text{area of } \triangle LNQ}{\text{area of } \triangle QNS}$, [1]
 - $\frac{\text{area of } \triangle RLM}{\text{area of } \triangle NLS}$. [2]

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

The variables x and y are connected by the equation $y = \frac{x^2}{4} + \frac{1}{x} - 3$.

The table below shows some values of x and the corresponding values of y , correct to 1 decimal place.

x	0.2	1	2	3	4	5	6.5	8
y	2.0	-1.8	k	-0.4	1.3	3.5	7.7	13.1

- (a) Find the value of k . [1]
- (b) Using a scale of 2 cm to 1 unit, draw a horizontal x -axis for $0.2 \leq x \leq 8$.
Using a scale of 1 cm to 1 unit, draw a vertical y -axis for $-2 \leq y \leq 14$.
On your axes, plot the points given in the table and join them with a smooth curve. [3]
- (c) Use your graph to solve the equation $\frac{x^2}{4} + \frac{1}{x} = 3$. [2]
- (d) By drawing a tangent, find the gradient of the curve at the point (5, 3.5). [2]
- (e) By drawing a suitable straight line on your graph, solve
 $x^3 - 4x^2 - 16x + 4 = 0$. [3]



Diagram I

In the question, the hut can be modelled as a cylinder with a cone on top, as shown in Diagram I. The roof is the curved surface of a cone and is supported by a central vertical pole.

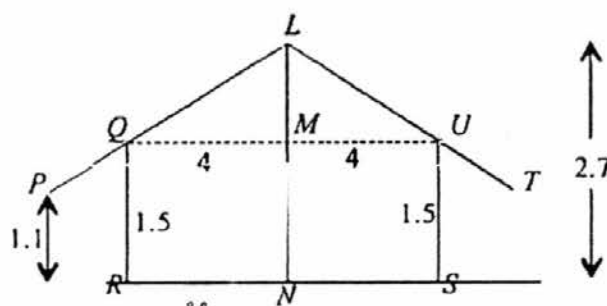


Diagram II

Diagram II shows a vertical cross-section of the hut. QU and RS are horizontal. Both P and T are 1.1 m vertically above the ground level. $LN = 2.7$ m, $QM = MU = 4$ m and $QR = US = 1.5$ m.

- (a) Calculate
- the volume of the interior of the hut, [3]
 - the surface area of the roof. [4]
- (b) At noon, the sun is directly above the hut. The shadow of the overhanging section of the roof on the ground is a circular ring around the hut. At this time of the day, a minimum shadow of 50 m^2 is needed to keep the family cool. The central vertical pole LN can be adjusted in height to change the area of the shadow formed by the roof. Explain why it is not possible to provide the family with the required 50 m^2 of shadow. [3]

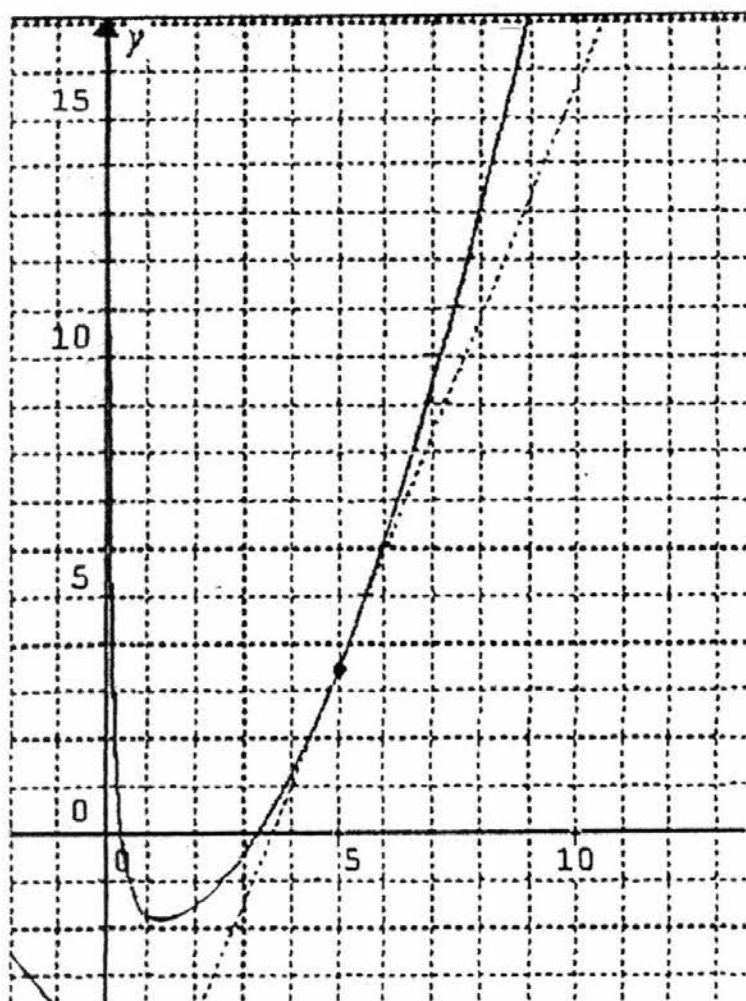
END OF PAPER

2016 Secondary 4 Prelims Mathematics Paper 2 (Answer Key)

1a	$\frac{12}{x}$
1b	$\frac{24}{2x+1}$
1d	$x = 5.755$ or -6.255
1e	5.00 hours (3sf)
2ai	$\angle BCF = 54^\circ$ ($\angle$ s in the same segment)
2aii	$\angle BFC = 85^\circ$ ($\angle$ sum of Δ)
2aiii	$\angle BAC = 36^\circ$ ($\angle$ in semi-circle)
2aiv	$\angle BAG = 103^\circ$ (ext $\angle$ of cyclic quad)
2b	$\angle BCE = 41^\circ$ (alt $\angle$ s) $\angle ACE = 54^\circ + 41^\circ = 95^\circ$ AC is not perpendicular to CE , hence CE is not tangent to the circle at C . (tan $\perp$ rad)
3ai	9
3aiia	6.63 h
3aiib	1.73 h
3aiii	The girls sleep longer hours with a higher mean number of hours. The girls are also more consistent with a smaller standard deviation
3bia	$\frac{3}{11}$
3bib	$\frac{7}{10}$
3bic	$\frac{24}{55}$
3bii	4 green eggs added.
4ai	25 cm
4aii	10 cm (accept $30.5 - 19.5 = 11$)
4aiii	5
4b	35.5 cm (accept 36 cm)
4c	Brand B fertilizer is better as it has a higher median. Plants grow taller with Brand B.
5ai	$\begin{pmatrix} 6 \\ 8 \end{pmatrix}$
5aii	10 units
5aiii	$D(-27, -42)$

5bi	$\begin{pmatrix} 5 & 3 & 2 \\ 11 & 8 & 6 \\ 8 & 5 & 4 \end{pmatrix}$
5bii	$\begin{pmatrix} 184 \\ 454 \\ 310 \end{pmatrix}$
5biii	The total cost price incurred by each shop.
5biv	$\begin{pmatrix} 0.1 & 0 & 0 \\ 0 & 0.15 & 0 \\ 0 & 0 & 0.2 \end{pmatrix}$
5bv	$\begin{pmatrix} 18.4 \\ 68.1 \\ 62 \end{pmatrix}$
6a	$x \geq 2\frac{3}{7}$
6b	$\frac{3}{2x-1} - \frac{1}{3x-1} + \frac{1}{(3x-1)(2x-1)}$ $= \frac{3(3x-1) - (2x-1) + 1}{(3x-1)(2x-1)}$ $= \frac{9x-3-2x+1+1}{(3x-1)(2x-1)}$ $= \frac{7x-1}{(3x-1)(2x-1)}$
6c	$y = \pm \sqrt{\frac{x+1}{x-3}}$
7i	$\angle BOC = 0.749 \text{ rad (3sf)}$
7ii	$BD = 4.76 \text{ cm (3sf)}$
7iii	$OD = 5.13 \text{ cm (3sf)}$
7iv	Area of shaded region = 6.12 sq cm (3sf)
8ai	Bearing of R from Q = 114°
8aii	$PR = 141 \text{ m (3sf)}$
8aiii	Area of field PQRS = 6620 sq m (3sf)
8aiv	$\angle QPR = 57.0^\circ \text{ (1dp)}$
8b	41.3 m (3sf)

9ai	$-2a + 2b$
9aai	$-3a + 4b$
9aiii	$\overline{LM}$ $= a + b$
9ci	$\frac{3}{4}$
9cii	1
9ciii	$\frac{\Delta RLM}{\Delta NLS} = \frac{7}{16}$
10a	-1.5
10b	See attached graph
10c	$x = 3.25$ (accept 3.2 – 3.3) or 0.4 (accept 0.3 – 0.5)
10d	Draws tangent at $x = 5$ and estimates (change in y)/(change in x) 2.3 – 2.6
10e	Add $y = x + 1$ $x = 0.25$ or 6.35
11ai	Volume of hut = 95.5 m^3 (3sf)
11aai	93.3 m^2 (3sf)
11b	It is not possible to have a shadow of 50 m^2 at noon.



Calculator Model:
(if applicable)



Paya Lebar Methodist Girls' School (Secondary)
Preparatory Examination 2016
Secondary 4 Express

Name: _____ ()

Class: _____

MATHEMATICS

4048/01

Paper 1

12 May 2016

Candidates answer on the Question Paper.

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The total of the marks for this paper is 80.

My Target is: _____

For Examiner's Use

80

Mathematical Formulae

Compound interest

$$\text{Total amount} = P \left(1 + \frac{r}{100} \right)^n$$

Mensuration

$$\text{Curved surface area of a cone} = \pi r l$$

$$\text{Surface area of a sphere} = 4\pi r^2$$

$$\text{Volume of a cone} = \frac{1}{3} \pi r^2 h$$

$$\text{Volume of a sphere} = \frac{4}{3} \pi r^3$$

$$\text{Area of triangle } ABC = \frac{1}{2} ab \sin C$$

$$\text{Arc length} = r\theta, \text{ where } \theta \text{ is in radians}$$

$$\text{Sector area} = \frac{1}{2} r^2 \theta, \text{ where } \theta \text{ is in radians}$$

Trigonometry

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$a^2 = b^2 + c^2 - 2bc \cos A$$

Statistics

$$\text{Mean} = \frac{\sum fx}{\sum f}$$

$$\text{Standard deviation} = \sqrt{\frac{\sum fx^2}{\sum f} - \left(\frac{\sum fx}{\sum f} \right)^2}$$

Answer **all** the questions.

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1 Solve $\frac{x}{4} - \frac{x}{7} = \frac{1}{3}$.

Answer $x =$ _____ [1]

- 2 During a sale, a cabinet is sold at 35% discount.
A further reduction of 20% is given on the discounted price if a discount coupon is used.
A customer uses a discount coupon and pays \$140.40 for the cabinet.

Calculate the original price of the cabinet.

•• Answer \$ _____ [2]

- 3 Eight students took a Mathematics quiz and six of the scores were recorded as shown below.

8 10 13 9 9 10

The mean score for the quiz was 10 and the modal score was also 10.

Calculate the values of the two remaining scores.

Answer _____ and _____ [2]

- 4 Spherical dust particles of type *A* and type *B* have diameters of 2.5 micrometres and 10 micrometres respectively.

- (a) Find the volume of one particle of *A* in m^3 .
Give your answer in standard form.

Answer (a) _____ m^3 [2]

- (b) The mass of 1 million particles of *A* is 15 micrograms.
Given that both types of particles have the same density, find the mass of 1 million particles of *B* in micrograms.

Answer (b) _____ micrograms [2]

- 5 Simplify $\frac{3}{x+2} - \frac{2x-5}{x^2+x-2}$.

Answer _____ [2]

6 $\varepsilon = \{\text{integers } x : 6 \leq x < 16\}$

$A = \{\text{integers } x : 4 < \frac{x}{2} \leq 7\}$

$B = \{\text{integers divisible by 3}\}$

- (a) Draw a Venn diagram to illustrate this information.

Answer (a)

[1]

- (b) List the elements contained in the set $A \cap B$.

Answer (b) _____ [1]

- (c) Write down $n(A \cup B')$.

Answer (c) _____ [1]

- (d) A number k is chosen at random from ε . Find the probability that $k \in (A \cap B')$.

Answer (d) _____ [1]

7 Factorise completely $6x^3 - 2x^2 - 24x + 8$.

Answer _____ [2]

- 8 It is given that $\overrightarrow{AB} = \begin{pmatrix} -3 \\ 5 \end{pmatrix}$ and $\overrightarrow{BC} = \begin{pmatrix} -2 \\ 7 \end{pmatrix}$.

(a) Calculate $|\overrightarrow{AC}|$.

Answer (a) _____ units [2]

(b) Find the coordinates of point B if C is the point $(-1, 4)$.

Answer (b) $B(\text{_____} , \text{_____})$ [1]

- 9 Tim deposits \$32 000 in an account that pays compound interest yearly.
The balance, \$ A , of the account after t years is given by the formula $A = 32\,000 \times 1.025^t$.

(a) Find the rate of interest per annum.

Answer (a) _____ % [1]

(b) Calculate A when $t = 3$.

Answer (b) \$ _____ [1]

(c) Find the percentage increase in the balance after 3 years.

Answer (c) _____ % [1]

- 10 The masses of students from two classes are shown below.

For
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Use

Class A	
Mass (kg)	Frequency
$30 < x \leq 40$	2
$40 < x \leq 50$	10
$50 < x \leq 60$	13
$60 < x \leq 70$	7

Class B
Mean = 53.1 kg
Standard Deviation = 7.5 kg

- (a) For Class A, calculate an estimate for

- (i) the mean mass of the students,

Answer (a)(i) _____ kg. [1]

- (ii) the standard deviation of the mass.

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

- (b) 'The students in Class B have greater mass.'
Do you agree? Give a reason to support your answer.

Answer (b) _____

[1]

- 11 On Saturday, Anne and Sue each received some sweets.
Sue received x sweets and Anne received 32 sweets more than Sue.
On Sunday, Anne gave 40 of her sweets to Sue.
The table shows the number of sweets each girl has on the two days.

	Anne	Sue
Saturday	$x + 32$	x
Sunday	y	$x + 40$

- (a) Write down an expression for y in terms of x .

Answer (a) _____ [1]

- (b) Given that, on Sunday, Sue had five times as many sweets as Anne,

- (i) write down an equation in x and solve it,

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

- (ii) find the total number of sweets received by the girls.

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

- 12 Written as the product of its prime factors, the numbers

$$A = 2 \times 3^2 \times 7,$$

$$B = 2^2 \times 3 \times 7^2.$$

If the HCF and LCM of the numbers A , B and C are 6 and 8820 respectively, find the smallest number that C could be.

Answer $C =$ _____ [2]

- 13 A sum of money was shared among A , B and C .

C was given $\frac{2}{5}$ of the sum of money.

The remainder was shared between A and B in the ratio $1 : 3$.

- (a) Find the ratio of money received by A , B and C .

Answer (a) _____ : _____ : _____ [2]

- (b) If C was given \$160 less than B , find the total sum of money shared amongst them.

Answer (b) \$ _____ [1]

- 14 A tank can be filled by a large pipe alone in 3 hours.

If the tank is filled by a small pipe alone, it will take t hours longer.

If it takes 2 hours for both pipes to fill up the tank, find the value of t .

Answer $t =$ _____ [4]

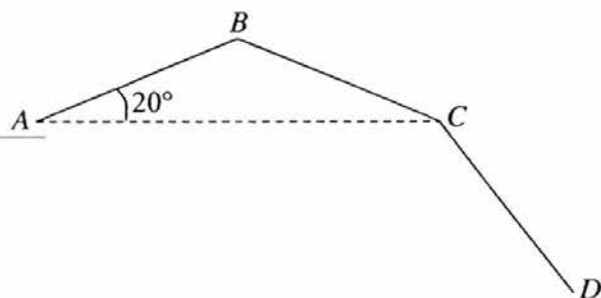
- 15 (a) Solve the inequalities $-7 \leq 4 - 3x < 2$.

Answer (a) _____ [2]

- (b) Write down all the integers that satisfy $-7 \leq 4 - 3x < 2$.

Answer (b) _____ [1]

- 16 The diagram shows four vertices A , B , C and D of a regular polygon.
It is given that angle $BAC = 20^\circ$.



Calculate

- (a) angle ABC ,

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

- (b) the number of sides the polygon has,

Answer (b) _____ sides [1]

- (c) angle ACD .

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

- 17 Two buckets are geometrically similar.

The ratio of the area of the bases of the buckets is 4 : 9.

- (a) The area of the top of the smaller bucket is 48 cm^2 . What is the area of the top of the larger bucket?

Answer (a) _____ cm^2 [1]

- (b) The ratio of the heights of the buckets can be written in the form 1 : k .
Find the value of k .

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

- (c) Both buckets are completely filled with water.

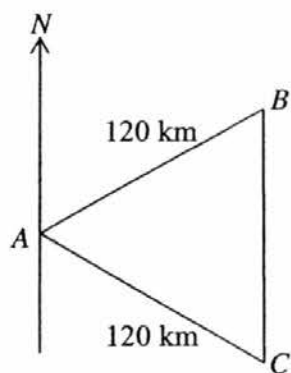
The amount of water in the smaller bucket is $10\frac{2}{3}$ litres.

Find the amount of water in the larger bucket. Give your answer in cm^3 .

Answer (c) _____ cm^3 [2]

- 18 The diagram shows the position of three lighthouses A , B and C .
 Given that $AB = AC = 120$ km and the bearing of B from A is 055° .
 C is due south of B .

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- (a) Find the bearing of A from

(i) B ,

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

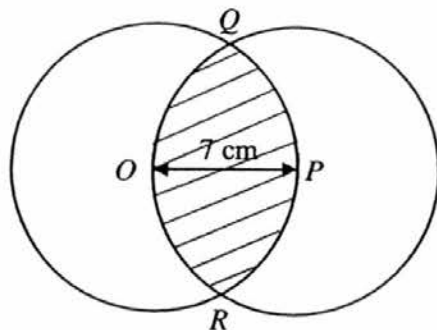
(ii) C .

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

- (b) Calculate the distance between B and C .

Answer (b) _____ km [2]

- 19 The diagram shows two circles of equal radii of 7 cm, with O and P as the centres of the circles.
The points O and P are 7 cm apart.



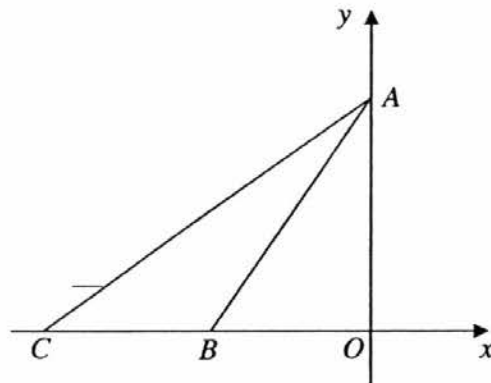
Calculate the area of the shaded region.

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Use

Answer _____ cm^2 [4]

- 20 The diagram shows a straight line AC with an equation of $3y - 2x = 30$.
 B is the point $(-5, 0)$.

For
Examiner's
Use



Find

- (a) the length of AC ,

Answer (a) _____ units [2]

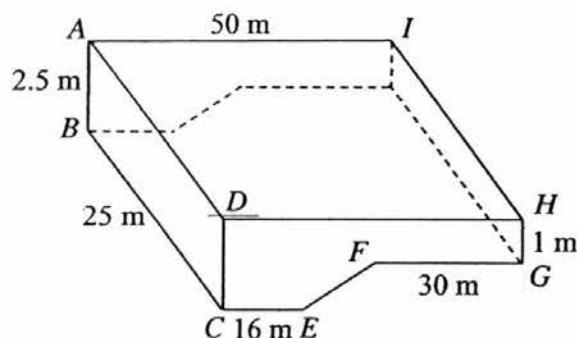
- (b) the area of triangle ABC ,

Answer (b) _____ units² [1]

- (c) the perpendicular distance from B to AC .

Answer (c) _____ units [2]

- 21 The diagram shows a swimming pool with $AB = 2.5$ m, $BC = 25$ m, $CE = 16$ m, $FG = 30$ m, $GH = 1$ m and $AI = 50$ m.



- (a) Calculate the volume of water needed to fill the pool completely.

Answer (a) _____ m^3 [4]

- (b) If water is pumped into the pool at a rate of $40 \text{ m}^3/\text{min}$, how long will it take to fill the pool completely?

Give your answer in minutes and seconds, correct to the nearest second.

Answer (b) _____ min _____ s [1]

- 22 At a funfair, a stall sells two different types of popcorn, salted and caramel. Each cup of salted popcorn is sold at \$2 while each cup of caramel popcorn is sold at \$3.50.

The sales at different time-period of the day are given in the table below.

Time period	Number of cups sold	
	Salted	Caramel
Morning	128	105
Afternoon	237	194
Evening	88	60

The information for the number of cups of popcorn sold in the day can be represented by a matrix N .

- (a) Write down matrix N .

$$\text{Answer (a)} \quad N = \begin{pmatrix} & \\ & \end{pmatrix} \quad [1]$$

The selling price of each type of popcorn is represented by a matrix S .

- (b) (i) Evaluate $A = NS$.

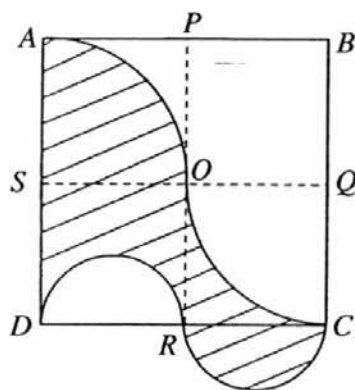
$$\text{Answer (b)(i)} \quad A = \begin{pmatrix} & \\ & \end{pmatrix} \quad [2]$$

- (ii) State what the elements of A represent. —

Answer (b)(ii) _____

[1]

- 23 The diagram shows a design to be painted on a wall.
 $ABCD$ is a square of side $2r$ cm.
 Points P , Q , R and S are midpoints of the sides AB , BC , CD and DA respectively.
 OA and OC are identical arcs. DR and CR are two semi-circular arcs drawn on side CD .



- (a) Show that the perimeter of the shaded region is $2r(1 + \pi)$ cm.

Answer (a)

[2]

- (b) Find the area of the shaded region. Give your answer in terms of r .

Answer (b) _____ cm^2 [2]

- 24 (a) Leng is going to take the GCE O-Level Examination at the end of the year. She estimates that she will definitely pass both Chemistry and Physics, and lists the probabilities of obtaining the grades for each subject in the table.

Grade	Probability of obtaining stated grade for Chemistry	Probability of obtaining stated grade for Physics
A1	0.1	0.2
A2	0.1	0.3
B3	0.3	0.3
B4	0.2	n
C5	m	0.1
C6	0.1	0

- (i) Write down the values of m and n .

Answer (a)(i) $m = \underline{\hspace{2cm}}$, $n = \underline{\hspace{2cm}}$ [1]

- (ii) In the computation of L1R5 for admission to junior college, find the probability that Leng will get a total of 3 points or less in both Science subjects.

Answer (a)(ii) $\underline{\hspace{4cm}}$ [2]

(b) The probability of passing a selection test at the first attempt is $\frac{4}{5}$.

If a candidate fails, he is given at most two more attempts and the probability of passing a re-test is $\frac{9}{10}$.

(i) Find the probability that a candidate fails after 3 attempts.

Answer (b)(i) _____ [1]

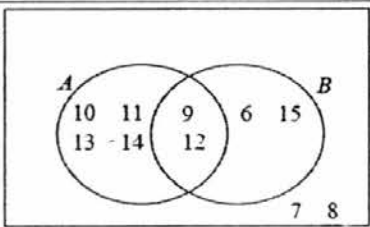
(ii) Describe a situation where the probability could work out to be $\frac{9}{50}$.

Answer (b)(ii) _____

[1]

End of Paper

Answer Key

1	$x = 3\frac{1}{9}$	13a	3 : 9 : 8
2	\$270.	13b	\$3200.
3	10 and 11.	14	3
4(a)	$8.18 \times 10^{-18} \text{ m}^3$	15a	$\frac{2}{3} < x \leq 3\frac{2}{3}$
4(b)	960	15b	1, 2 and 3
5	$\frac{1}{(x-2)}$	16a	140°
6(a)		16b	9
6(b)	{9, 12}	16c	120°
6(c)	8	17a	108
6(d)	0.4	17b	$1\frac{1}{2}$
7	$2(3x+1)(x+2)(x-2)$	17c	36 000 cm ³ .
8	(a) 13 units (b) (1,-3)	18a i	235°
9(a)	2.5% per annum	18a ii	305°
9(b)	\$34460.50	18b	138km
9(c)	7.69%	19	60.2 cm ²
10	(ai) 52.8 kg (aii) 8.56 kg	20	a)18.0 b)50 c) 5.55
11(a)	$y = x - 8$	21	a) 1925 b) 48 min 8 s
11(b)	(i)20 (ii) 72	22a	$= \begin{pmatrix} 128 & 105 \\ 237 & 194 \\ 88 & 60 \end{pmatrix}$
12	30	22b	$\begin{pmatrix} 623.50 \\ 1153 \\ 386 \end{pmatrix}$

23a	$2r(1 + \pi) \text{ cm}$	24a	$m=0.2, n=0.1$ ii) 0.07
23b	$2r^2 \text{ cm}^2$	24 b	$\frac{9}{50}$ i) 0.003 ii) 50