Name: _____

Class	Registration Number

CHIJ KATONG CONVENT
END-OF-YEAR EXAMINATION 2012
MATHEMATICS
PAPER 1

SECONDARY ONE (EXPRESS) Duration: 1 hour 15 minutes

Classes: 103, 104, 105, 106

INSTRUCTIONS TO CANDIDATES

Write your name, class and registration number in the spaces at the top of this page and on any separate answer paper used.

Write in dark blue or black pen.

You may use a pencil for any diagrams or graphs.

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

Answer **all** questions

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

If working is needed for any question, it must be shown in the space below that question.

Omission of essential working will result in loss of marks.

The total number of the marks for this paper is 50.

You are expected to use a scientific calculator to evaluate explicit numerical expressions.

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.

FOR EXAMINER'S USE	
Total marks	/50

This question paper consists of 10 printed pages (including this cover page).

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Name_____( ) Sec_____

Answer **all** the questions.

1. (a) Showing your working clearly, write 1764 as a product of prime factors in index notation.
   (b) Find the lowest common multiple of $\sqrt{1764}$, $3^2 \times 5 \times 7^3$ and $3 \times 7^2 \times 11$, leaving your answer in index notation.

Answer (a).....[1]

(b).....[2]

2. Trees are to be planted along 2 roads, Barre's Boulevard and Nicholas' Highway, of lengths 1260 m and 1680 m respectively. A tree is to be planted at the beginning and at the end of each road. The distance between one tree and the next on Barre's Boulevard is the same as that on Nicholas' Highway.
   (a) Find the maximum possible distance between two consecutive trees on both roads such that the conditions above are satisfied.
   (b) Find the number of trees that are needed altogether on both roads.

Answer (a).....m [1]

(b).....[1]

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3. Evaluate $\frac{3x^2 + 4x - 19}{\sqrt[3]{51 - x}}$ when $x = -\frac{\pi}{2}$, giving your answer to 4 significant figures.

Answer .....[2]

4. Mrs Tan bought x kg of sugar. She used $\frac{3}{8}$ of it to bake a cake and $\frac{7}{9}$ of the remainder to make cookies. Find, in terms of x, the amount of sugar she had left.

Answer ..... kg [2]

5. Find the next two terms of the sequence: $-\frac{1}{2}$, $\frac{1}{3}$, $1\frac{1}{6}$, 2, ____, ____.

Answer ....., ... [2]

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6. Complete the following.

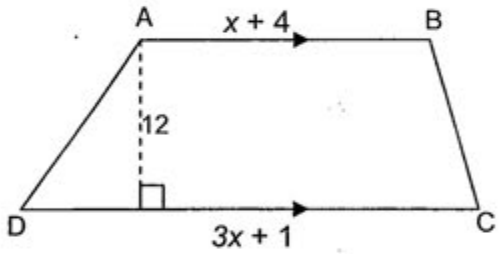
(a) 5.8 m = _____mm [1]

(b) 6.5 cm^2 = _____m^2 [1]

(c) 108 km/h = _____m/s [1]

(d) 840 cm^3 = _____litres [1]

7. In the diagram, *ABCD* is a trapezium. *AB* is parallel to *DC*, $AB = (x + 4)$ cm, $DC = (3x + 1)$ cm and the height is 12 cm. Given that the area of the trapezium is 114 cm^2, find the value of x.



Answer x = ...[3]

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8. The table below shows the parking charges in Changi Airport.

Carpark Charges
$2.00 for the first hour $0.90 for each subsequent half hour or part thereof* Night charges are at a flat rate of $4 from 12 am – 6 am **Sample calculation: For the first 2 h 15 min, the charges will amount to $4.70*

Liam will be leaving Singapore on a one day trip to Penang to stage a concert and intends to park his car overnight. He arrives at the airport at 6.32 am and parks at the above carpark. He takes the 7.28 am flight to Penang.

(a) If the flight takes 1 h 17 min, at what time does he arrive in Penang?

After the concert, he flies back to Singapore and arrives the next day. It is 1.18 pm as he drives out of the carpark.

(b) Calculate the total time that the car has been parked at the airport.

(c) Calculate the parking charges that he pays.

Answer (a).....[1]

(b).....h ..... min...[1]

(c).....[2]

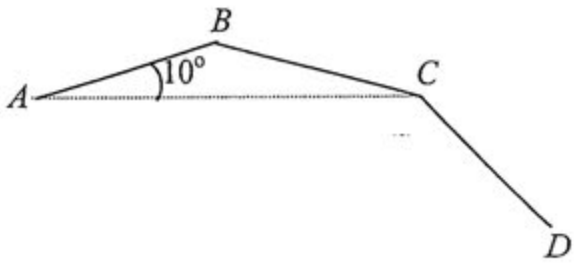
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9. AB, BC and CD are adjacent sides of a regular polygon. Given that $\angle CAB = 10°$, calculate

(a) the exterior angle of the polygon,

(b) the number of sides of the polygon,

(c) $\angle ACD$.



Answer (a).....[1]

(b).....sides [1]

(c).....[1]

10. Simplify the following algebraic expressions.

(a) $5x - 2\{5x - 2[y - 3(x - y)]\}$

(b) $\frac{16b}{10a} \div 1\frac{1}{3}ab^3$

Answer (a).....[2]

(b).....[2]

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11. Express $\frac{5(3a+4b-1)}{4} - \frac{-b+8a+5}{6}$ as a single fraction in its simplest terms.

Answer .....[2]

12. Factorise the following expressions completely, giving each in its simplest form.

(a) $3p(5-2b)-(5-2b)$

(b) $\frac{1}{6}x - \frac{1}{3}xy - 8y + 4$

Answer (a).....[1]

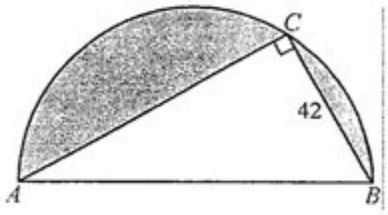
(b).....[2]

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13. The figure consists of a semicircle with a right-angled triangle inscribed in it. The length of BC is 42 cm and $BC : CA : AB = 0.75 : 1 : 1\frac{1}{4}$. Taking π as $\frac{22}{7}$, find

(a) the area of the shaded region,

(b) the perimeter of the shaded region : perimeter of the unshaded region.



Answer (a).....[2]

(b).....[3]

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14. Study the following pattern.

$$2^2 - 0^2 = 4 \times 1$$
$$3^2 - 1^2 = 4 \times 2$$
$$4^2 - 2^2 = 4 \times 3$$
$$5^2 - 3^2 = 4 \times 4$$

(a) Write down the 7^{th} line of the pattern.

(b) Write down the n^{th} line of the pattern.

(c) Use the pattern to find the positive integers x and y such that $x^2 - y^2 = 484$.

Answer (a).....[1]

(b).....[1]

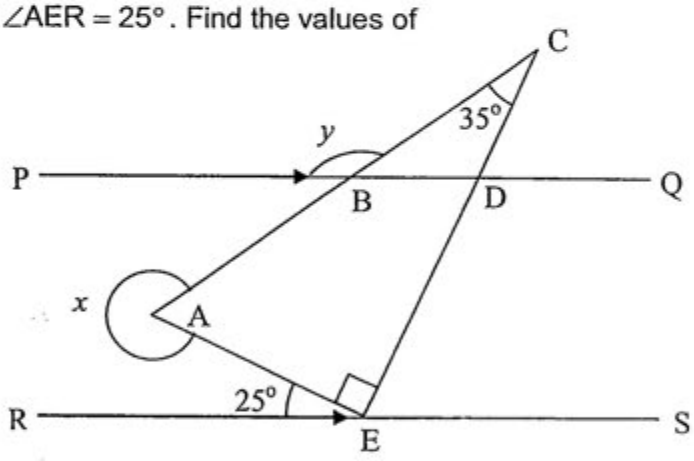
(c).....[1]

15. In the diagram below, PQ is parallel to RS.

$\angle AEC$ is a right-angle, $\angle BCD = 35°$ and $\angle AER = 25°$. Find the values of

(a) x,

(b) y.



Answer (a) x =.....[2]

(b) y =.....[2]

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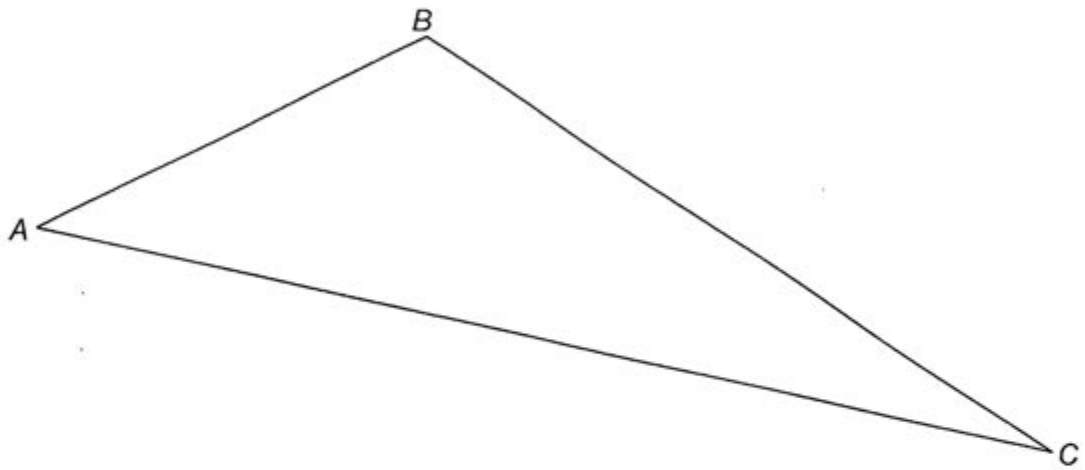
16. The figure below shows a triangle *ABC*.
(a) Construct

(i) the angle bisector of $\angle ABC$. [1]

(ii) the perpendicular bisector of the line *BC*. [1]

(b) Mark the point X where the perpendicular bisector of BC meets AC. [1]

(c) Measure and write down the size of $\angle XBC$.



Answer (c) $\angle XBC$ =.....[1]

End of Paper

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Qn	Marking Scheme	Mk	Remarks
1.	(a) $1764 = 2^2 \times 3^2 \times 7^2$ 2 | 1764 2 | 882 3 | 441 3 | 147 7 | 49 7 | 7 1	A1	
	(b) $\sqrt{1764} = \sqrt{2^2 \times 3^2 \times 7^2} = 2 \times 3 \times 7 = 42$	A1	
	(c) LCM of $\sqrt{1764}$, $3^2 \times 5 \times 7^3$ and $3 \times 7^2 \times 11$: $2 \times 3 \times 7$ $3^2 \times 5 \times 7^3$ $3 \times 7^2 \times 11$ LCM $= 2 \times 3^2 \times 5 \times 7^3 \times 11$	A1	
2.	(a) 10 | 1260, 1680 6 | 126, 168 7 | 21, 28 3, 4 HCF $= 10 \times 6 \times 7 = 420$	A1	
	(b) No. of trees $= 3 + 1 + 4 + 1 = 9$	A1	
3.	$\frac{3(-\frac{\pi}{2})^2 + 4(-\frac{\pi}{2}) - 19}{\sqrt[3]{51-(-\frac{\pi}{2})}} = -4.773$ (4 sf)	M1, A1	
4.	Amt of sugar used $= \frac{3}{8}x + \frac{7}{9}\left(x - \frac{3}{8}x\right) = \frac{31}{36}x$	M1	
	Amt of sugar left $= x - \frac{31}{36}x = \frac{5}{36}x$	A1	
5.	$2\frac{5}{6}$, $2\frac{5}{6} + \frac{5}{6} = 2\frac{5}{6}$, $3\frac{2}{3}$	A1, A1	
6.	(a) 5.8 m $= 5.8 \times 100 \times 10 = 5\,800$	A1	
	(b) 106.5 cm^2 $= 6.5 \div 100^2$ $m^2 = 0.01065$ m^2	A1	
	(c) 108 km/h $= \frac{108 \times 1000}{1 \times 60 \times 60}$ m/s $= 30$ m/s	A1	
	(d) 840 cm^3 $= 840 \div 1000 = 0.84$ litres	A1	
7.	Area of trapezium $= 100$ cm^2 $\frac{1}{2} \times (x + 4 + 3x + 1) \times 12 = 114$ $6(4x + 5) = 114$	M1	
	$4x + 5 = 19$ $4x = 14$	M1	
	$x = 3.5$	A1	

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Qn	Marking Scheme	Mk	Remarks
8.	(a) 7.28 am + 1 h + 17 min = 8.45 am	A1	
	(b) 6.32 am – 6.32 am, next day (24h), 6.32 am – 12.32 pm (6h), 12.32 – 1.18 pm (46 min), Total time = 30 h 46 min	A1	
	(c) Carpark charges:	M1, A1	
	6.32 – 7.32 am: 1st hour ---------- $2		
	7.32am – 11.32pm: 16 h ----------16 × 2 × $0.90 =$28.80		
	11.32pm – 12mn: ½ h ----------1 × $0.90 = $0.90		
	12mn – 6am ----------$4		
	6am – 1pm ---------- 7 × 2 × $0.90 = $12.60		
	1 – 1.18pm ---------- $0.90		
	Total Carpark charges = $(2 + 28.80 + 0.90 + 4 + 12.60 + 0.90) = $49.20		
9.	(a) $10° + 10° = 20°$ (ext ∠ = sum of 2 int opp ∠s)	A1	
	(b) $\frac{360°}{20°} = 18$ sides	A1	
	(c) Int ∠ = 160°, ∴∠ACD = 160° – 10° = 150°	A1	
10.	(a) $5x - 2\{5x - 2[y - 3(x - y)]\}$ $= 5x - 2\{5x - 2[y - 3x + 3y]\}$ $= 5x - 2\{5x - 2[4y - 3x]\}$ $= 5x - 2\{5x - 8y + 6x\}$ $= 5x - 2\{11x - 8y\}$ $= 5x - 22x + 16y$ $= -17x + 16y$	M1 A1	
	(b) $\frac{16b}{10a} \div 1\frac{1}{3}ab^3$ $= \frac{16b}{10a} \div \frac{4ab^3}{3} = \frac{16b}{10a} \times \frac{3}{4ab^3}$ $= \frac{6}{5a^2b^2}$	M1 A1	
11.	$\frac{5(3a+4b-1)}{4} - \frac{-b+8a+5}{6}$ $= \frac{15(3a+4b-1)-2(-b+8a+5)}{12}$ $= \frac{45a+60b-15+2b-16a-10}{12}$ $= \frac{29a+62b-25}{12}$	M1 A1	
12.	(a) $3p(5-2b)-(5-2b)$ $= (5-2b)(3p-1)$	A1	
	(b) $\frac{1}{6}x - \frac{1}{3}xy - 8y + 4$ $= \frac{1}{6}x(1-2y) - 4(2y-1)$ $= \frac{1}{6}x(1-2y) + 4(1-2y)$	M1 A1	

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Qn	Marking Scheme	Mk	Remarks
	$= (1-2y)\left(\frac{1}{6}x+4\right)$		
13.	$BC : CA : AB = 0.75 : 1 : 1\frac{1}{4} = 3 : 4 : 5$ $AC = \frac{4}{3}\times 42 = 56$ cm, $AB = \frac{5}{3}\times 42 = 70$ cm Radius of semicircle $= 70 \div 2 = 35$ cm (a) area of the shaded region $= \frac{1}{2}\times\frac{22}{7}\times 35^2 - \frac{1}{2}\times 42\times 56$ $= 1925 - 1176$ $= 749$ cm^2 (b) Perimeter of the shaded region $= \frac{1}{2}\times 2\times\frac{22}{7}\times 35 + 42 + 56$ $= 110 + 98$ $= 208$ cm Perimeter of unshaded region = 42 + 56 + 70 = 168 cm Per of shaded : per of unshaded = 749 : 168 = 107 : 24	M1 A1 M1 B1 A1	
14.	(a) Line 7: $8^2 - 6^2 = 4\times 7$ (b) Nth line: $(n+1)^2 - (n-1)^2 = 4\times n$ (c) $x^2 - y^2 = 484$, n = 484 ÷ 4 = 121, x = 122, y = 120	A1 A1 A1	
15.	(a) ∠BAE = 180° – 90° – 35° = 55° (∠ sum of rt-angled Δ) ∠x = 360° – 55° (∠s at a point) = 305° (b) ∠BDC = 25° + 90° = 105° (corresp. ∠s) ∠y = 105° + 35° = 140° (ext ∠ = sum of 2 int opp ∠s)	M1 A1 M1 A1	
16.	See next pg.		

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Name : _____

Class	Registration Number

CHIJ KATONG CONVENT

END-OF-YEAR EXAMINATION 2012
MATHEMATICS
PAPER 2

SECONDARY ONE (EXPRESS) Duration: 1hour 15 minutes

Classes: Sec 1.3, 1.4, 1.5, 1.6

Additional materials:
Writing paper

INSTRUCTIONS TO CANDIDATE

Write your name, class and registration number on all the work you hand in.
Write in dark blue or black pen.
You may use a pencil for any diagrams or graphs
Do not use staples, paper clips, highlighters, glue, correction tape or fluid.

Answer all questions on the writing papers provided.

If working is needed for any question it must be shown with the answer.
Omission of essential working will result in loss of marks.
Calculators should be used 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 50.

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Mathematical Formulae

Mensuration

Curved Surface area of a cone = πrl

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

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

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

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Answer **all** questions.

1. A sequence of 5 diagrams is shown below.

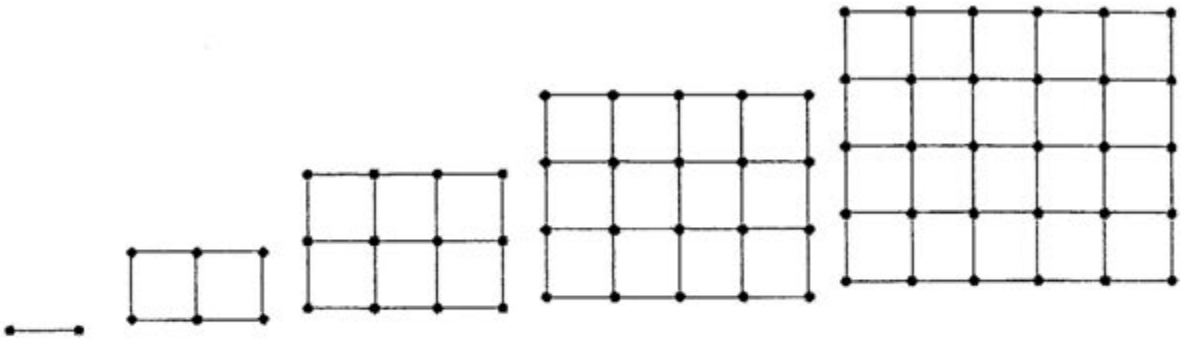


Diagram 1 Diagram 2 Diagram 3 Diagram 4 Diagram 5

The number of dots and lines in each of the diagrams are shown in the table below.

Diagram number	1	2	3	4	5	6
Number of dots	2	6	12	20	30	p
Number of lines	1	7	17	31	49	q

(a) Find the values of p and q. [2]

(b) Write down an expression for the number of dots in diagram n. [1]

(c) The number of lines in diagram n is $2n^2 - 1$.

Find the diagram number which has 287 lines. [2]

2. (a) Simplify $5p - \frac{3}{2}(6p - 8)$. [2]

(b) Solve the equation $\frac{5t}{2} - \frac{t}{3} = 1$. [2]

(c) Express $\frac{3}{x(x-1)} - \frac{2}{5x}$ as a single fraction in its simplest form. [2]

(d) Given that $k = 2\sqrt{3a - k^2}$, express k in terms of a. [3]

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3. A trekker is planning a trip. He investigates the possible routes.

(a) If he travels on route A, which is 600 km long, he expects to cover x km per day. If he returns on route B, which is 100 km longer than route A, he would expect to cover $(x + 5)$ km per day.

Write down an expression, in terms of x, for the number of days that he expects to take on

(i) route A, [1]

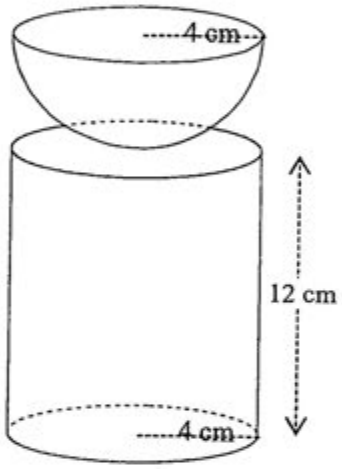
(ii) route B. [1]

(b) If the trekker took 20 days to complete route B, find the value of x. [2]

4. The diagram shows a solid trophy which consists of a hemispherical glass top that sits on top of a cylindrical wooden base.
The radii of both the cylinder and the hemisphere are 4 cm.

The height of the cylindrical base is 12 cm.

Correct your answers to three significant figures.



(a) Find

(i) the total surface area of the solid trophy, assuming that the point of contact between the hemisphere and the cylinder has negligible surface area, [3]

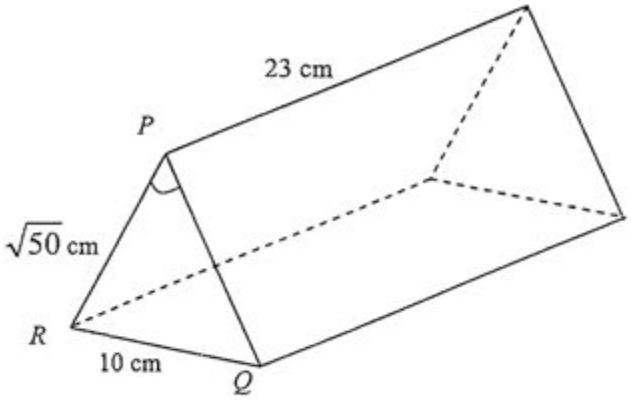
(ii) the total volume of the trophy. [3]

(b) Given that the density of glass is 2.5 g/cm^3, find the mass of the hemispherical glass top. [1]

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5. The diagram shows a prism and the cross-section is an isosceles triangle.

$RQ = 10$ cm, $PR = PQ = \sqrt{50}$ cm and the length of the prism is 23 cm.



(a) Given that the height of triangle PQR is 5 cm, find the area of triangle PQR. [1]

(b) Calculate the volume of the prism. [1]

(c) Find the total surface area of the prism. [2]

6. A man ran 2.4 km in 16 minutes. He then walked a further 900 m at an average speed of 4 km/h.

Calculate

(a) his speed, in km/h, in the first 16 minutes, [1]

(b) the time, in minutes, he took to walk, [1]

(c) his average speed, in m/s, for the whole distance travelled. [2]

7. A plate of chicken rice costs \$1 more than a plate of fried noodles. The amount of pocket money Alvin received is just enough for him to buy 10 plates of chicken rice or 15 plates of fried noodles. He wishes to buy equal number of plates of chicken rice and fried noodles, what is the maximum of each type can he buy with the money? [3]

8. A woman is 7 times as old as her daughter. If in 5 years' time, she is 4 times as old as her daughter, what are their present ages? [2]

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9. In a quadrilateral $PQRS$, PQ is parallel to RS. $PQ = 8$ cm, $QR = 6$ cm, $\angle PQR = 90°$ and $\angle QPS = 130°$.

(a) Construct the quadrilateral $PQRS$. [2]

(b) Find the perimeter of the quadrilateral. [2]

10. In a kite $ABCD$, $AD = CD = 8$ cm, $\angle ADC = 60°$ and $\angle DCB = \angle DAB = 130°$.

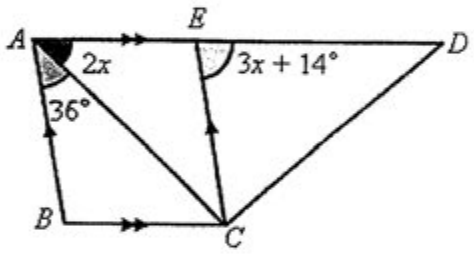
(a) Construct an accurate drawing of the kite. [2]

(b) Measure the length of the shorter diagonal. [1]

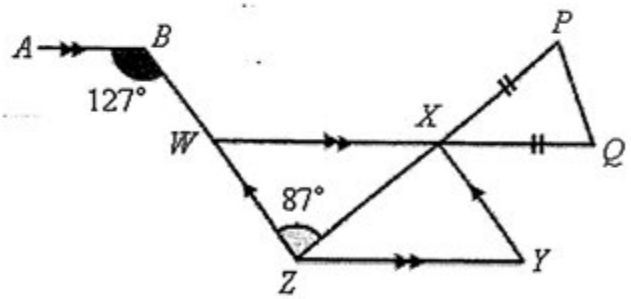
11. (a) $ABCE$ is a parallelogram and AED is a straight line. Given that $\angle CED = 3x + 14°$, $\angle CAE = 2x$ and $\angle BAC = 36°$. Find

(i) the value of x, [2]

(ii) $\angle ABC$. [1]



(b) The figure consists of parallelogram $WXYZ$ and an isosceles triangle XPQ. Given that AB, WQ and ZY are parallel, $\angle ABW = 127°$ and $\angle WZX = 87°$, find $\angle XQP$. [2]



End of Paper

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***Minus 1M each ONCE for P1&P2 for i) wrong units and ii) wrong s.f .**

***Minus 2M ONCE for P1&P2 if the student did not write angle rules AT ALL and minus 1M if student did not write angle rules SOMETIMES.**

1. A sequence of 5 diagrams is shown below.

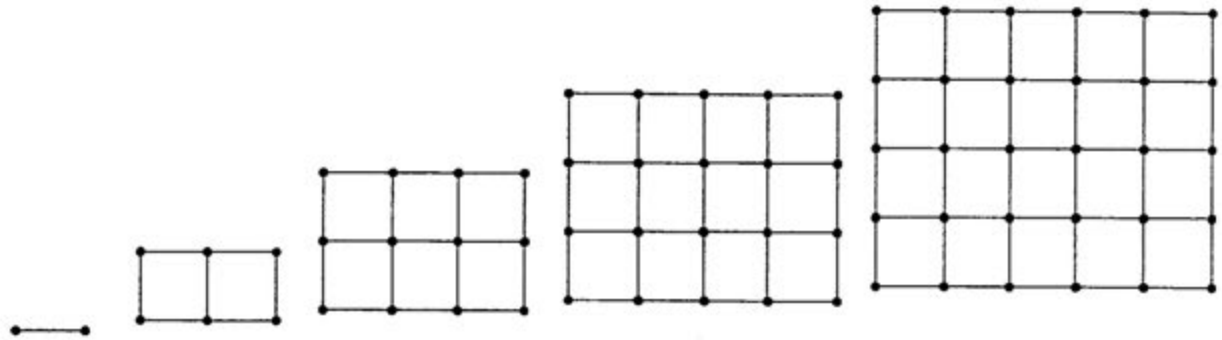


Diagram 1 Diagram 2 Diagram 3 Diagram 4 Diagram 5

The number of dots and lines in each of the diagrams are shown in the table below.

Diagram number	1	2	3	4	5	6
Number of dots	2	6	12	20	30	p
Number of lines	1	7	17	31	49	q

(a) Find the value of p and of q. [2]

p=42 [A1] and q= 71 [A1]

(b) Write down an expression for the number of dots in diagram n. [1]

n^2+n [A1] or n(n + 1) [A1] n x (n+1)

(c) The number of lines in diagram n is $2n^2 - 1$.

Find the diagram number which has 287 lines. [2]

$2n^2-1 = 287$

$2n^2=287+1$

$n=\sqrt{\frac{288}{2}}$ [M1]

n=12 [A1]

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2. (a) Simplify $5p-\frac{3}{2}(6p-8)$. [2]

$5p-9p+12[M1]$
$=-4p+12[A1]$

(b) Solve the equation $\frac{5t}{2}-\frac{t}{3}=1$. [2]

$\frac{3(5t)}{6}-\frac{2t}{6}=1$
$\frac{15t-2t}{6}=1[M1]$
$13t=6$
$t=\frac{6}{13}[A1]$
Or t= 0.462 (3s.f)

(c) Express $\frac{3}{x(x-1)}-\frac{2}{5x}$ as a single fraction in its simplest form. [2]

$\frac{3}{x(x-1)}-\frac{2}{5x}$
$=\frac{3(5)}{5x(x-1)}-\frac{2(x-1)}{5x(x-1)}$
$=\frac{15-2(x-1)}{5x(x-1)}[M1]$
$=\frac{15-2x+2}{5x(x-1)}$
$=\frac{17-2x}{5x(x-1)}[A1]$

(d) Given that $k=2\sqrt{3a-k^2}$, express k in terms of a. [3]

$k=2\sqrt{3a-k^2}$
$k^2=4(3a-k^2)[M1]$
$k^2=12a-4k^2$
$5k^2=12a[M1]$
$k^2=\frac{12a}{5}$
$k=\pm\sqrt{\frac{12a}{5}}[A1]$

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3. A trekker is planning a trip. He investigates the possible routes.

(a) If he travels on route A, which is 600 km long, he expects to cover x km per day. If he returns on route B, which is 100 km longer than route A, he would expect to cover $(x + 5)$ km per day.

Write down an expression, in terms of x, for the number of days that he expects to take on

(i) route A,

$\frac{600}{x}$ **days [A1]**

(ii) route B.

$\frac{700}{x+5}$ **days [A1]**

(b) If the trekker took 20 days to complete route B, find the value of x. [2]

$\frac{700}{x+5} = 20$

$700 = 20(x+5)[M1]$

$700 = 20x + 100$

$20x = 600$

$x = 30[A1]$

or $\frac{700}{20} = x + 5$

$x + 5 = 35[M1]$

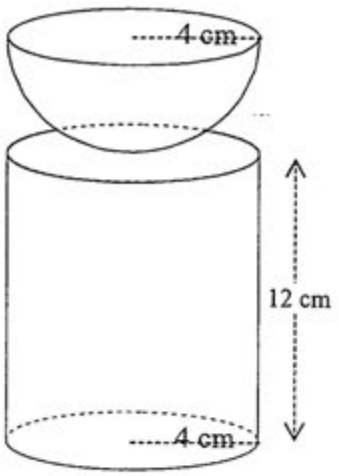
$x = 30[A1]$

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4. The diagram shows a solid trophy which consists of a hemispherical glass top that sits on top of a cylindrical wooden base. Both the radii of the cylinder and the hemisphere are 4 cm.

The height of the cylindrical base is 12 cm.

Correct your answers to three significant figures.



(a) Find

(i) the total surface area of the trophy, assuming that the point of contact between the hemisphere and the cylinder has negligible surface area, [3]

Surface area of hemisphere

$$= \frac{1}{2}(4\pi r^2) + \pi r^2$$
$$= 2(3.142)(4^2) + (3.142)(4^2)$$
$$= 150.816 cm^2 [M1]$$

Surface area of cylinder

$$= \pi dh + 2\pi r^2$$
$$= (3.142)(8)(12) + 2(3.142)(4^2)$$
$$= 301.632 + 100.544$$
$$= 402.176 cm^2 [M1]$$

Total surface area= 150.816+402.176 =552.992 or 553 cm^2 (3 s.f) [A1]

(ii) the total volume of the trophy, [3]

Volume of hemisphere

$$= \frac{1}{2}(\frac{4}{3}\pi r^3)$$
$$= \frac{2}{3}(3.142)(4^3)$$
$$= 134.0587 cm^3 [M1]$$

Volume of cylinder

$$= \pi r^2 h$$
$$= (3.142)(4^2)(12)$$
$$= 603.264 cm^3 [M1]$$

Total volume = 134.0587+603.264=737.3227=737cm^3 (3 s.f)

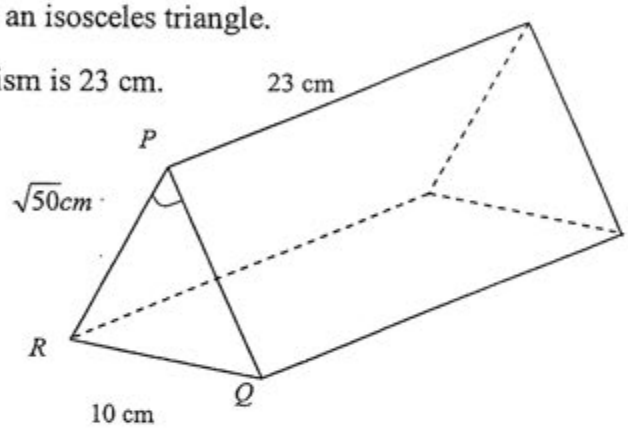
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(b) Given that the density of glass is 2.5 g/cm^3, find the mass of the hemispherical glass top. [1]

Mass = Volume x Density
= 134.0587x2.5
= 335.14675 g
= 335 g (3 s.f) [A1]

5. The diagram shows a prism whose cross-section is an isosceles triangle.

RQ = 10 cm, $PR = \sqrt{50}$ cm and the length of the prism is 23 cm.



(a) Given that the height of triangle PQR is 5 cm, find the area of triangle PQR. [1]

Area=0.5(10)(5) =25 cm^2 [A1]

(b) Calculate the volume of the prism. [1]

Volume = base area x height
= 25 x 23 = 575 cm^3 [A1]

(c) Find the total surface area of the prism. [2]

Total surface area = (25x2)+ (10x23)+2(23x $\sqrt{50}$) [M1]
= 605.269
= 605 cm^2 [A1]

6. A man ran 2.4 km in 16 minutes. He then walked a further 900 m at an average speed of 4 km/h.

Calculate

(a) his speed, in km/h, in the first 16 minutes, [1]

Speed = 2.4/(16/60) = 9 km/h [A1]

(b) the time, in minutes, he took to walk, [1]

900m = 0.9km

Time= 0.9/4=0.225 h = 13.5 minutes [A1]

(c) his average speed, in m/s, for the whole distance travelled. [2]

Average speed= Total dist./Total time taken

Total distance = 2.4+0.9= 3.3km=3300m

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Total time = 16+13.5 = 29.5 minutes

Average speed = 3300/1770 [M1] = 1.86 m/s [A1]

7. A plate of chicken rice costs $1 more than a plate of fried noodles. The amount of pocket money Alvin received is just enough for him to buy 10 plates of chicken rice or 15 plates of fried noodles. If he wishes to buy equal number of plates of chicken rice and fried noodles, how many of each type can he buy with the money? [3]

Let x be the cost of one plate of fried noodles.
Cost of one plate of fried noodles = $x
Cost of one plate of chicken rice = $(x+1)

Amount of money spent on chicken rice= Amount of money spent on fried noodles
10(x+1) = 15x [M1]
10x+10=15x
15x-10x=10
5x=10
x=2 [A1]

Total amount of money Alvin has = 15 x 2=$30

2x + 1 = 5
30/5 = 6
He can buy 6 plates of chicken rice and fried noodles. [A1]

8. A woman is 7 times as old as her daughter. If in 5 years' time, she is 4 times as old as her daughter, what are their present ages? [2]

Let the daughter's present age be x years old.
Present age:
Woman= 7x years old
Daughter = x years old

In 5 years' time:
Women= 7x+5 years old
Daughter = x+5 years old

7x+5 = 4(x+5) [M1]
7x+5 = 4x+20
3x=15
x=5 [A1]

Present age of woman= 7x5=35 years old and daughter = 5 years old. [A1] (Award 1 mark for correct ages of both mum and daughter)

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9. In a quadrilateral $PQRS$, PQ is parallel to RS. $PQ = 8$ cm, $QR = 6$ cm, $\angle PQR = 90°$ and $\angle QPS = 130°$.

(a) Accurate construction [1] Label *PQRS*, angles and lengths [1]

(b) Find the perimeter of the quadrilateral. [2]

Perimeter= 8+6+13+7.9 [M1]

= (34.9 ± 0.2) cm [A1]

10. In a kite $ABCD$, $AD = CD = 8$ cm, $\angle ADC = 60°$ and $\angle DCB = \angle DAB = 130°$.

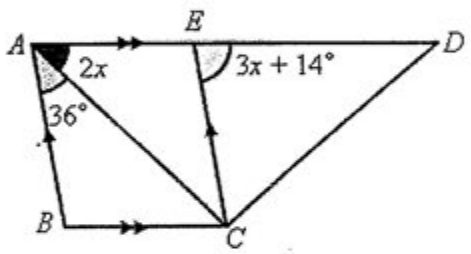
(a) Construct an accurate drawing of the kite. [2]

Accurate construction [1] Label *ABCD*, angles and lengths [1]

(b) Measure the length of shorter diagonal. [1]

AC = **(8 ± 0.1) cm [A1]**

11. (a) $ABCE$ is a parallelogram and AED is a straight line. Given that $\angle CED = 3x + 14°$, $\angle CAE = 2x$ and $\angle BAC = 36°$.



(i) Find the value of x. [2]

$\angle ACE = 36°$ **(alt. angles)**

Method 1:

3x+14=2x+36 (ext. angle = sum of int. opp. Angles)[M1]

x=36-14=22° [A1] (Accept any suitable method)

Method 2:

$\angle AEC = 180° - (3x + 14)$ **(adj. angles on a (str.) line)**

$180° - 2x - 36° = \angle AEC$ **(angle sum of triangle)**

$180° - 2x - 36° = 180° - (3x + 14)$

$180° - 2x - 36° = 180° - 3x - 14$

$x = 22°$[A1]

No units required

(ii) Find $\angle ABC$. [1]

$\angle AEC = 180° - (3x + 14)$ **(adj. angles on a (str.) line)**

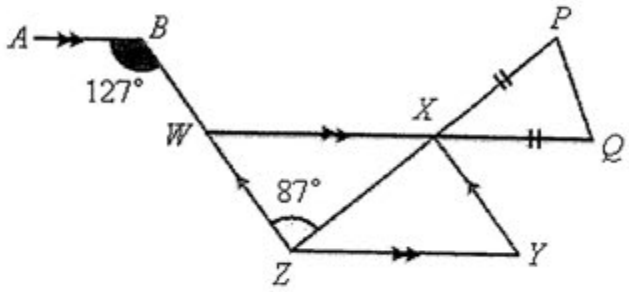
= 180° - (66+14)

= 100°

$\angle AEC = \angle ABC = 100°$ **[A1] (Accept any suitable method)**

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(c) The figure consists of parallelogram WXYZ and an isosceles triangle XPQ. Given that AB, WQ and ZY are parallel, $\angle ABW = 127°$ and $\angle WZX = 87°$, find $\angle XQP$. **[2]**



$\angle WZY = 127°$ **(alt. angles)**

$\angle YZX = 127 - 87 = 40°$ **[A1]**

$\angle WXZ = 40°$ **(alt. angles)**
$\angle QXP = 40°$ **(vert. opp. angles)**
$\angle XQP = (180 - 40)/2$ **(isos. triangle)**
=70° [A1]

End of Paper

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