

Class	Index Number	Candidate Name
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**ANG MO KIO SECONDARY SCHOOL
FINAL EXAMINATION 2018
SECONDARY ONE EXPRESS**

**MATHEMATICS
Paper 1**

Setter: Mrs Linda Wang

Wednesday

10 October 2018

1 hour 15 minutes

Candidates answer on the Question Paper.

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 pencil for any diagrams or graphs.
Do not use staples, paper clips, 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 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**.

For Examiner's Use
50

This document consists of **12** printed pages.

- 1 (a) Express 984.6089 correct to
(i) 3 decimal places,

Answer [1]

- (ii) 2 significant figures.

Answer [1]

- (b) Express the ratio 0.12 : 0.64 in its simplest form.

Answer [1]

- 2 (a) List all the integers that satisfy $-4 < x \leq 2$.

Answer [1]

- (b) Solve the inequality $-4x < 36$.

Answer [1]

- 3 (a) Express 2016 as a product of its prime factors. Give your answer in index notation.

Answer 2016 = [2]

- (b) Find the smallest possible integer p such that $2016p$ is a perfect cube.

Answer p = [1]

4 Solve the following equations

(a) $7x - 15 = 18 - 4x$,

(b) $\frac{2x}{3} - \frac{3x-10}{2} = 7$.

Answer $x =$ [2]

Answer $x =$ [3]

- 5 James invested $\frac{1}{4}$ of his business income on research, $\frac{2}{5}$ on training workers and the remainder on operations of the business.

(a) Find the fraction of his income spent on operations.

Answer [2]

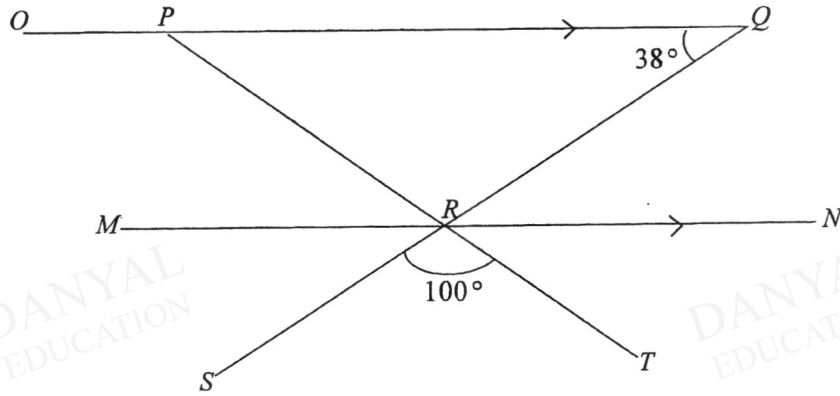
- (b) Find the total income if James invested \$30 000 more on training workers than on research.

Answer \$ [2]

- 6 Given that $x = -1$, $y = 3$ and $z = -4$, evaluate $\frac{x^2y}{z-y}$.

Answer [2]

- 7 In the diagram, SRQ , PRT are straight lines and MRN is parallel to OPQ . $\angle PQR = 38^\circ$ and $\angle SRT = 100^\circ$.



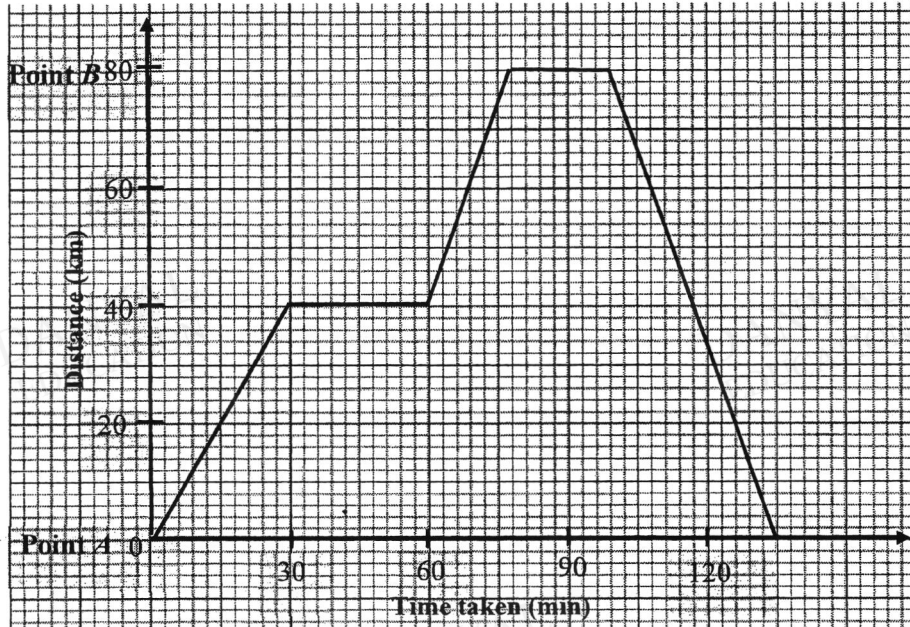
Find, stating your reasons clearly,
 (a) $\angle MRS$,

Answer $\angle MRS = \dots\dots\dots^\circ$ [1]

(b) $\angle OPR$.

Answer $\angle OPR = \dots\dots\dots^\circ$ [2]

- 8 The diagram below shows a distance-time graph for the journey of a car from Point *A* to Point *B* and its journey back to *A*. It left Point *A* at 0900 hrs.



- (a) How far was the car from Point *A* at 0915?

Answer km [1]

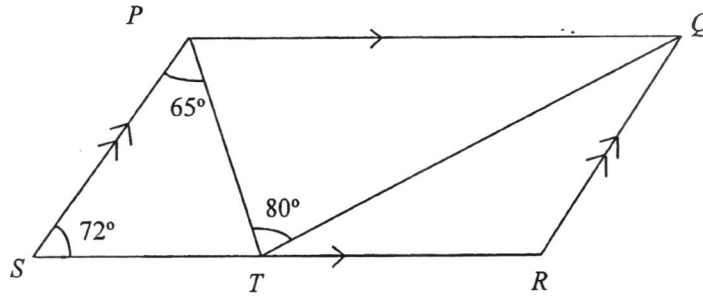
- (b) Find the time the car arrived back at Point *A*.

Answer [1]

- (c) Find the average speed of the car, in km/h, for the whole journey.

Answer km/h [2]

- 9 $PQRS$ is a parallelogram with $\angle SPT = 65^\circ$, $\angle PTQ = 80^\circ$ and $\angle PST = 72^\circ$.



Stating your reasons clearly, calculate

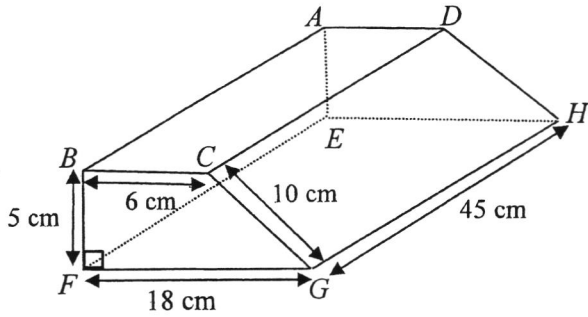
- (a) $\angle QRT$,

Answer $\angle QRT = \dots\dots\dots^\circ$ [1]

- (b) $\angle QTR$.

Answer $\angle QTR = \dots\dots\dots^\circ$ [2]

10



The diagram shows a trapezoidal prism with four rectangular faces. $BC = 6$ cm, $BF = 5$ cm, $FG = 18$ cm, $CG = 10$ cm and $GH = 45$ cm.

Calculate the

- (a) volume of the prism,

Answer cm^3 [2]

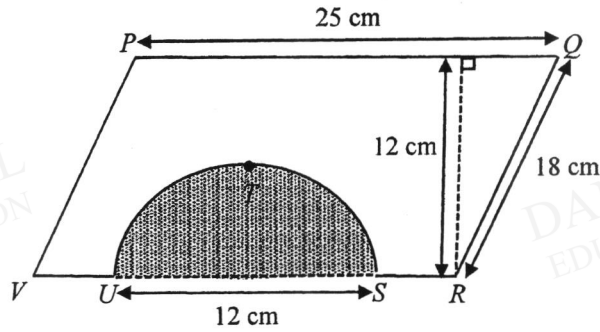
- (b) total surface area of the prism.

Answer cm^2 [3]

11 In the figure below, $PQRV$ is a parallelogram with height 12 cm.

$PQ = VR = 25$ cm, and $PV = QR = 18$ cm.

A semi-circle of diameter 12 cm is removed from the parallelogram as shown.



Find the

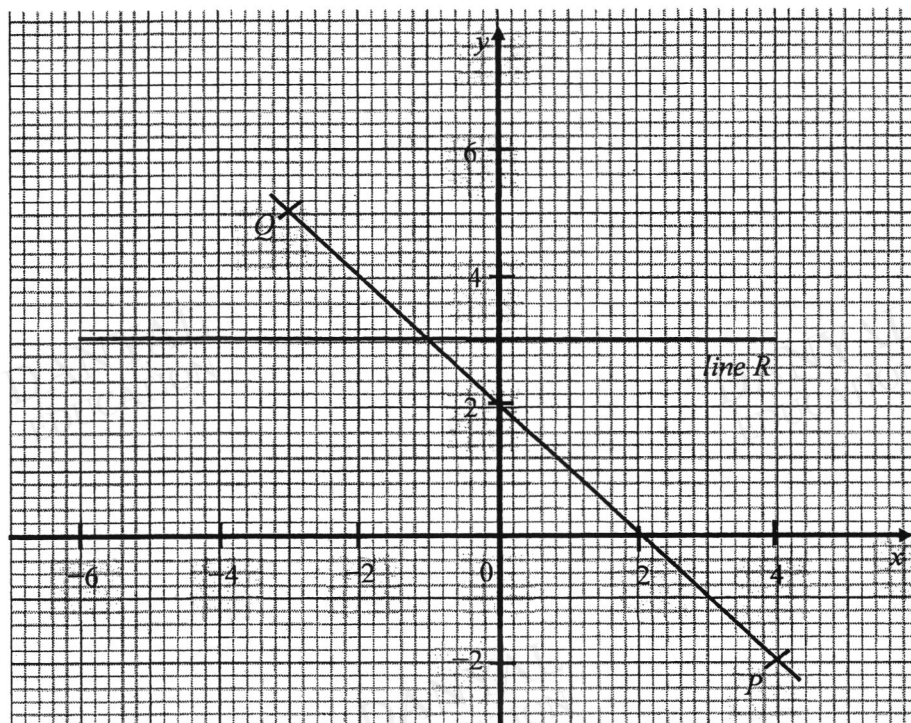
(a) area of the region $PQRSTUV$ after semi-circle STU is removed,

Answer cm² [2]

(b) perimeter of the unshaded region $PQRSTUV$.

Answer cm [2]

- 12 The graph of a line is shown below.



- (a) Write down the coordinates of the point P .

Answer $P = (\quad , \quad)$ [1]

- (b) State the y -intercept of the line PQ .

Answer [1]

- (c) Find the gradient of the line PQ .

Answer [2]

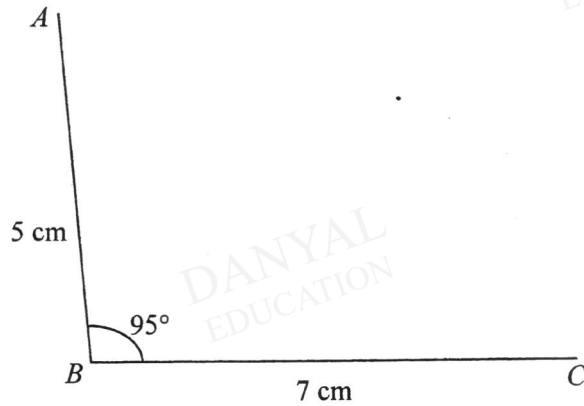
- (d) Write down the equation of line R .

Answer [1]
 4048/01/2018

13 The quadrilateral $ABCD$ is such that $AB = 5$ cm, $BC = CD = 7$ cm, $AD = 8$ cm and $\angle ABC = 95^\circ$. AB and BC are drawn below.

- (a) Complete the quadrilateral. [2]
- (b) Construct the perpendicular bisector of line BC . [1]
- (c) Construct the angle bisector of $\angle BCD$. [1]

Answer



(d) Measure $\angle BCD$.

$\angle BCD = \dots\dots\dots^\circ$ [1]

(e) Mark the point X where the two bisectors in (b) and (c) meet. [1]

(f) Measure and write down the length of CX

Answer $CX = \dots\dots\dots$ cm [1]

END OF PAPER

Class	Index Number	Name
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**ANG MO KIO SECONDARY SCHOOL
FINAL EXAMINATION 2018
SECONDARY ONE EXPRESS**

MATHEMATICS
Paper 2

4048/02

Thursday

4 October 2018

1 hour 15 minutes

Additional Materials: Answer Paper
 Graph Paper (1 sheet)

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 on both sides of the paper.
You may use a pencil for any diagrams or graphs.
Do not use staples, paper clips, 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 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 50.

Answer **all** the questions.

- 1 (a) Evaluate $\sqrt[3]{\frac{2(1.6)^2 - 7.94 + 9.9}{4(-53.754)^3}}$, giving your answer correct to 3 significant figures. [2]
- (b) Simplify the following expressions
- (i) $6x + 2y + 5(y - 2x)$, [1]
- (ii) $\frac{x+3}{4} - \frac{2x-4}{5}$. [2]
- (c) Factorise $18x - 36y + 54xy$ completely. [1]

- 2 (a) A shopkeeper earned a profit of \$500 when he sold a computer at a discount of 20% of its marked price. Calculate the marked price of the computer, given that the cost price of the computer is \$1700. [2]
- (b) A wallet costs 850 000 Korean Won (KRW). The exchange rate between Singapore dollars S\$1 and Korean Won is S\$1 = KRW815. Calculate the price of the wallet in Singapore dollars. [2]

- 3 The following shows the pricing for buffet dinner on weekends.

Restaurant Nice	
Each Adult : \$55	Each child : 50% of Adult Price
Promotion: For every 4 paying adults, the 5 th adult dines free.	

Restaurant Delicious	
Each Adult : \$80	Each child : \$25
Promotion: 50% discount for adults only.	

Mr Lim is planning to bring his family of 5 adults and 4 children for a buffet dinner.

- (a) How much must Mr Lim pay if his family is dining at Restaurant Nice? [2]
- (b) Explain, with clear mathematical working, which restaurant will offer a better deal. [2]

- 4 The cash price of a new car is \$90 500.
John buys the car under the hire purchase scheme as shown below.

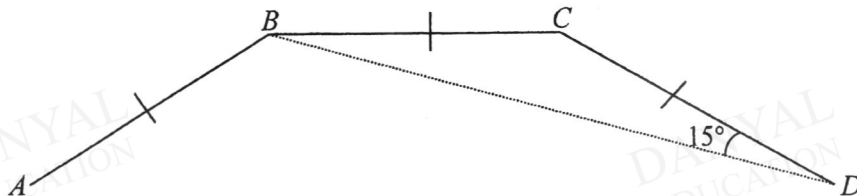
Hire Purchase Scheme

- a deposit of 20% of cash price
- simple interest of 3% per year over 5 years
- repayment to be made monthly

Calculate

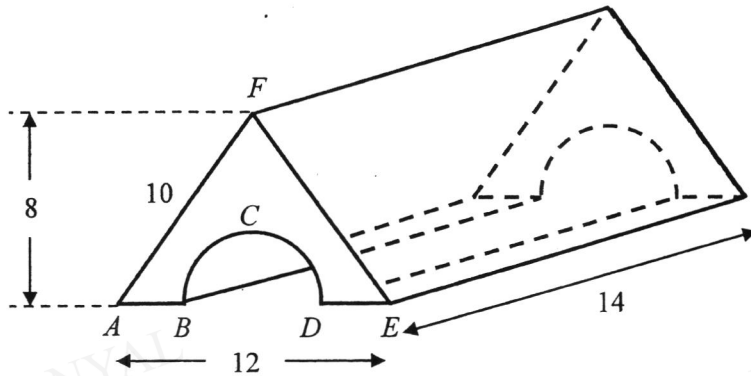
- (a) the total amount of interest payable, [3]
(b) the monthly instalment paid by John. [2]

- 5 (a) Three comets moving through the galaxy will pass through our solar system every 75 years, 120 years and 300 years respectively. The three comets were last observed in our solar system in the year 1680. In which year will all the three comets be seen in our solar system together again? [3]
- (b) The diagram below shows part of a regular n -sided polygon, $ABCD$.
It is given that $\angle BDC = 15^\circ$.



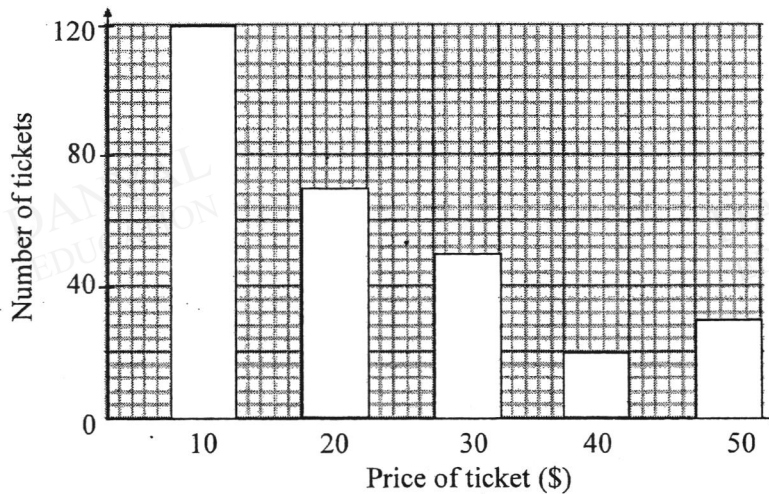
- (i) Find the exterior angle of the regular polygon. [2]
(ii) Calculate the number of sides that the polygon has. [2]

- 6 The diagram shows a toy block with a vertical height of 8 cm and length 14 cm.
 $AF = EF = 10$ cm, $AB = DE = 2$ cm and $AE = 12$ cm.



- (a) Calculate the volume of the toy block. [2]
- (b) It costs \$5.20 per cm^2 to paint the toy block.
 Calculate the cost of painting the toy block. [4]

- 7 The bar chart below shows the total ticket sales for a play that was held in a theatre with a seating capacity of 350.



- (a) How many tickets were sold altogether? [1]
- (b) How much money was collected from the ticket sales? [2]
- (c) Calculate the percentage of seats that was unoccupied. [2]

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

The following table shows the corresponding values of x and y for $y = 4 - \frac{1}{2}x$.

x	0	2	4	8
y	4	p	2	0

- (a) Find the value of p . [1]
- (b) Using a scale of 2 cm to 1 unit, draw a horizontal x -axis for $0 \leq x \leq 8$.
Using a scale of 4 cm to 1 unit, draw a vertical y -axis for $0 \leq y \leq 4$.
On your axes, plot the points given in the table and join them with a straight line. [3]
- (c) From your graph, find the value of x when $y = 1$. [1]
- (d) (i) On the same axes, draw the graph of $x = 3$. [1]
- (ii) Write down the coordinates of the point of intersection of the graphs of $y = 4 - \frac{1}{2}x$ and $x = 3$. [1]

- 9 The table below shows the different entrance fees to zoo.

Day / Time		Per Adult	Per Child (below 13 years old)
Monday to Friday	Before 2 p.m.	\$33	\$12
	After 2 p.m.	\$17	\$5
Saturday and Sunday	Before 2 p.m.	\$40	\$18
	After 2 p.m.	\$25	\$11

During a school excursion, a group of teachers and x Primary 2 students visited the zoo at 10 a.m. on a Thursday.

- (a) Write down an expression, in terms of x , for
- (i) the total entrance fees for the students, [1]
- (ii) the total entrance fees for the teachers if the number of teachers who went on the excursion was 220 fewer than the number of students. [1]
- (b) The total amount spent on entrance fees for teachers and students was \$3540.
- Form an equation, in terms of x , to represent the above information, and show that it can be simplified to $45x - 7260 = 3540$. [2]
- (c) Solve the equation $45x - 7260 = 3540$. [1]
- (d) Hence, find the number of teachers who went on the school excursion. [1]

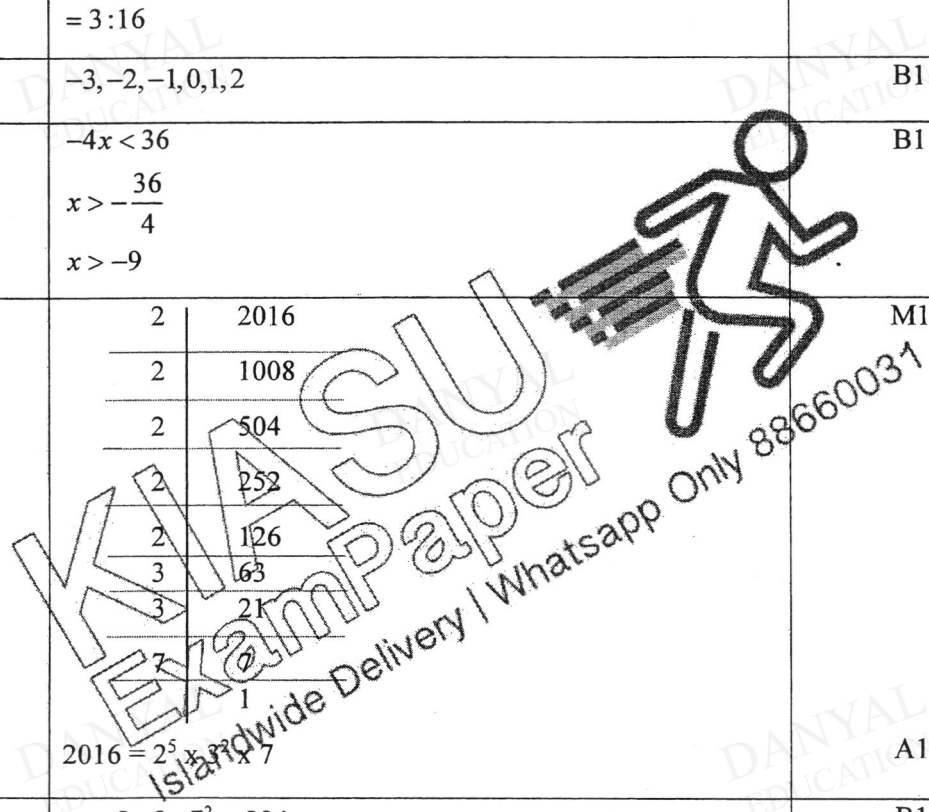
END OF PAPER

FINAL EXAMINATION 2018

SECONDARY ONE EXPRESS

MATHEMATICS PAPER 1

NO	SOLUTIONS	MARKS																		
1(a)(i)	984.609	B1																		
1(a)(ii)	980	B1																		
1(b)	$\frac{12}{100} : \frac{64}{100}$ $= 12 : 64$ $= 3 : 16$	B1																		
2(a)	-3, -2, -1, 0, 1, 2	B1																		
2(b)	$-4x < 36$ $x > -\frac{36}{4}$ $x > -9$	B1																		
3(a)	<table style="margin-left: auto; margin-right: auto;"> <tr><td>2</td><td>2016</td></tr> <tr><td>2</td><td>1008</td></tr> <tr><td>2</td><td>504</td></tr> <tr><td>2</td><td>252</td></tr> <tr><td>2</td><td>126</td></tr> <tr><td>3</td><td>63</td></tr> <tr><td>3</td><td>21</td></tr> <tr><td>7</td><td>3</td></tr> <tr><td>1</td><td>1</td></tr> </table> $2016 = 2^5 \times 3^2 \times 7$	2	2016	2	1008	2	504	2	252	2	126	3	63	3	21	7	3	1	1	M1 A1
2	2016																			
2	1008																			
2	504																			
2	252																			
2	126																			
3	63																			
3	21																			
7	3																			
1	1																			
3(b)	$p = 2 \times 3 \times 7^2 = 294$	B1																		
4(a)	$7x - 15 = 18 - 4x$ $11x = 33$ $x = 3$	M1 A1																		
4(b)	$\frac{2x}{3} - \frac{3x-10}{2} = 7$ $\frac{4x - 3(3x-10)}{6} = 7$ $\frac{4x - 9x + 30}{6} = 7$	M1 M1																		



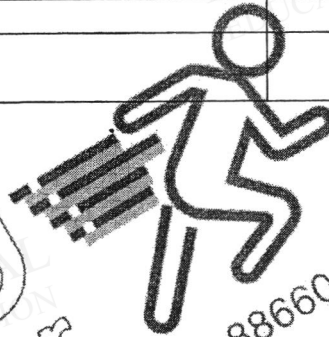
	$\frac{-5x+30}{6} = 7$ $-5x+30 = 42$ $-5x = 12$ $x = -\frac{12}{5}$ $x = -2\frac{2}{5}$ <p>Accept also $x = -2.4$</p>	A1
5(a)	$1 - \frac{1}{4} - \frac{2}{5} = \frac{7}{20}$	B2
5(b)	$\frac{2}{5} - \frac{1}{4} = \frac{3}{20}$ $\frac{2}{5} - \frac{1}{4} = \frac{3}{20}$ <p>3 units = \$30 000 1 unit = \$10 000 20 units = \$200 000</p>	M1 A1
6	$\frac{(-1)^2(3)}{-4-3}$ $= -\frac{3}{7}$	M1 A1
7(a)	$\angle ORN = \angle POR$ (alt. \angle s) = 38° $\angle MRS = 38^\circ$ (vert. opp \angle s)	M1 A1
7(b)	$\angle PRO = 100^\circ$ (vert. opp \angle s) $\angle OPR = 100^\circ + 38^\circ = 138^\circ$ (Ext. \angle = sum of 2 int. opp \angle s) Or $\angle ORN = \angle PON$ (alt. \angle s) = 38° $\angle PRM = \angle ORN$ (Vert. Opp \angle s) = 38° $\angle MRS = 38^\circ$ (alt. \angle s) $\angle PRM = 180^\circ - 38^\circ - 100^\circ = 42^\circ$ (\angle s on str. line) $\angle QPR = 42^\circ$ (alt. \angle s) $\angle OPR = 180^\circ - 42^\circ = 138^\circ$ (\angle s on str. line)	M1 A1 M1 A1
8(a)	20km	B1
8(b)	11.15am	B1
8(c)	<p>Total Distance = 160 km</p> <p>Total Time = $2\frac{1}{4}$ hr</p>	

	$\text{Average speed} = \frac{160}{2\frac{1}{4}}$ $= 71.1 \text{ km/h (to 3 s.f.)}$	M1 A1
9(a)	$\angle QRT = 180^\circ - 72^\circ = 108^\circ$ (\angle s on str line)	B1
9(b)	$\angle QPT = 180^\circ - 72^\circ - 65^\circ = 43^\circ$ (sum of int. angles = 180°) $\angle PQT = 180^\circ - 43^\circ - 80^\circ = 57^\circ$ (\angle sum of triangle) $\angle QTR = 57^\circ$ (alt. \angle s)	M1 A1
10(a)	$\text{Vol} = \frac{1}{2}(6+18)(5) \times 45$ $= 2700 \text{ cm}^3$	M1 A1
10(b)	<p>Surface area of 2 end faces = $2 \times 60 = 120 \text{ cm}^2$</p> <p>Surface area of lateral faces = $(5 + 6 + 10 + 18) \times 45$ = 1755 cm^2</p> <p>Total S. A = $120 + 1755$ = 1875 cm^2</p> <p>Or</p> <p>Area of $FGHE = 18 \times 45 = 810 \text{ cm}^2$ Area of $CD = GH = 10 \times 45 = 450 \text{ cm}^2$ Area of $ABCD = 6 \times 45 = 270 \text{ cm}^2$ Area of $MBFE = 5 \times 45 = 225 \text{ cm}^2$ Area of trapezium (2) = $5 \times (6 + 18) = 120 \text{ cm}^2$</p>	M1 A1
11(a)	<p>Area of parallelogram = $25 \times 12 = 300 \text{ cm}^2$</p> <p>Area of semi-circle = $\frac{1}{2} \times \pi \times (6)^2 = 18\pi \text{ cm}^2$</p> <p>Area of region $PQRSTUV =$ $300 - 18(3.142) = 243.44 = 243 \text{ cm}^2$ (to 3 s.f.)</p>	M1 A1
11(b)	<p>Perimeter = $25 + 2(18) + (25 - 12) + \frac{12}{2}(3.142)$</p> <p>= $92.852 \text{ cm} = 92.9 \text{ cm}$ (to 3 s.f.)</p> <p>Accept $92.84955592 = 92.8 \text{ cm}$ when use calculator value of π.</p>	M1 A1
12(a)	$P(4, -2)$	B1

12(b)	$y\text{-intercept} = 2$	B1
12(c)	$\text{Grad} = \frac{5 - (-2)}{-3 - (4)} = -1$	M1 A1
12(c)	$y = 3$	B1
13(a)	See Appendix 1 & 2 All correct with construction lines No construction lines	B2 B1
13(b)	Perpendicular bisector correctly constructed	B1
13(c)	Angle bisector correctly constructed	B1
13(d)	$\angle BCD = 93^\circ$, for $BC = 7$ cm $\angle BCD = 91^\circ$, for $BC = 7.1$ cm	
13(e)	Point X marked	B1
13(f)	$CX = 5.0$ cm (± 0.2), for $BC = 7$ cm $CX = 5.1$ cm (± 0.2), for $BC = 7.1$ cm	B1

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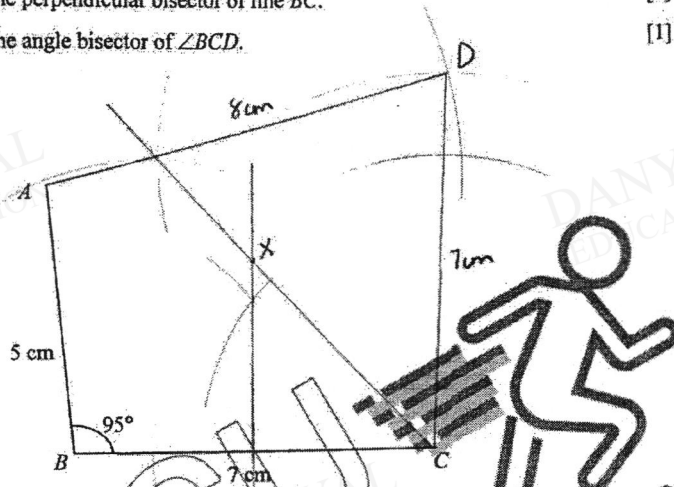
Appendix 1(BC = 7 cm)

12

- 13 The quadrilateral $ABCD$ such that $AB = 5$ cm, $BC = CD = 7$ cm, $AD = 8$ cm and $\angle ABC = 95^\circ$. AB and BC are drawn below.

- (a) Complete the quadrilateral. [2]
 (b) Construct the perpendicular bisector of line BC . [1]
 (c) Construct the angle bisector of $\angle BCD$. [1]

Answer



- (d) Measure $\angle BCD$.

$\angle BCD = \underline{\hspace{2cm}}^\circ$ [1]

- (e) Mark the point X where the two bisectors in (b) and (c) meet. [1]

- (f) Measure and write down the length of CX

Answer $CX = \underline{5.0}$ cm [1]

END OF PAPER

Appendix 2 (BC = 7.1 cm)

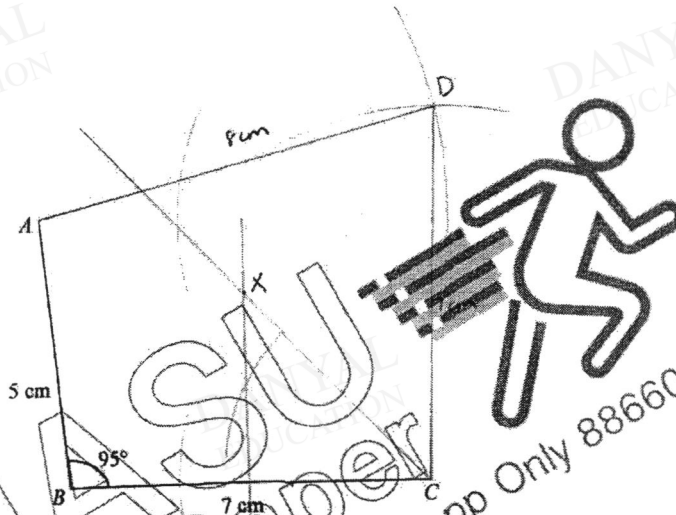
12

Based on
5.1 cm
and
7.1 cm

13 The quadrilateral $ABCD$ is such that $AB = 5$ cm, $BC = CD = 7$ cm, $AD = 8$ cm and $\angle ABC = 95^\circ$. AB and BC are drawn below.

- (a) Complete the quadrilateral. [2]
 (b) Construct the perpendicular bisector of line BC . [1]
 (c) Construct the angle bisector of $\angle BCD$. [1]

Answer



(d) Measure $\angle BCD$.

$\angle BCD =$ _____ [1]

(e) Mark the point X where the two bisectors in (b) and (c) meet. [1]

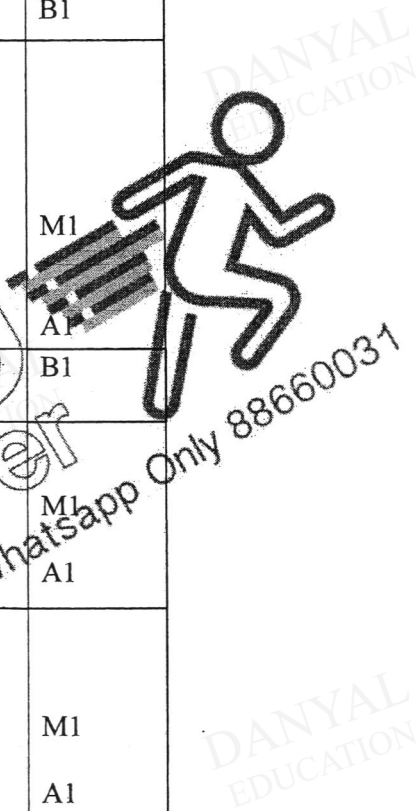
(f) Measure and write down the length of CX

Answer $CX =$ 5.1 cm [1]

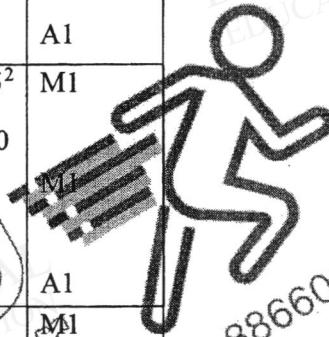
END OF PAPER

FINAL EXAMINATION 2018
SECONDARY ONE EXPRESS
MATHEMATICS PAPER 2

NO	SOLUTIONS	MARKS
1(a)	$\sqrt[3]{\frac{2(1.6)^2 - 7.94 + 9.9}{4(-53.754)^3}}$ $= -0.0225033393$ ≈ -0.0225	M1 A1
1(b)(i)	$6x + 2y + 5y - 10x$ $= 7y - 4x$	B1
1(b)(ii)	$\frac{x+3}{4} - \frac{2x-4}{5}$ $= \frac{5(x+3) - 4(2x-4)}{20}$ $= \frac{5x+15-8x+16}{20}$ $= \frac{31-3x}{20}$	M1 A1
1(c)	$18x - 36y + 54xy = 18(x - 2y + 3xy)$	B1
2(a)	<p>Selling price = $1700 + 500 = \\$2200$</p> <p>Marked price = $\frac{2200}{80} \times 100$</p> <p>$= \\2750</p>	M1 A1
2(b)	<p>KRW 815 → \$815</p> <p>KRW 850000 → \$850000</p> <p>$= \\$1042.94 / \\$1040 / \\1043</p>	M1 A1
3(a)	<p>Amount to be paid = $4 \times 55 + 2 \times 55$</p> <p>$= \\$330.$</p>	M1 A1
3(b)	<p>Amount payable at Restaurant Delicious</p> <p>$= 5 \times 80 \times 50\% + 4 \times 25$</p> <p>$= \\300</p> <p>Should dine at Restaurant Delicious as it is cheaper by \$30.</p>	M1 A1



4(a)	$\text{amount borrowed} = \frac{80}{100} \times 90500$ $= \$72400$ $\text{total interest} = 72400 \times \frac{3}{100} \times 5$ $= \$10860$	M1 M1 A1
4(b)	$\text{total amount payable} = 72400 + 10860$ $= \$83260$ $\text{monthly instalment} = \frac{83260}{60}$ $= \$1387.67 / \$1388 / \$1390$	M1 A1
5(a)	$\text{LCM} (75, 120, 300) = 2^3 \times 3 \times 5^2$ $= 600$ $1680 + 600 = 2280$ <p>\therefore All the three comets will be seen together again in the year 2280.</p>	M1 A1
5(bi)	$\angle EAC = 180^\circ - 15^\circ - 15^\circ$ $= 150^\circ$ <p>Exterior $\angle = 30^\circ$</p>	M1
5(bii)	$\text{No. of sides} = 360 \div 30$ $= 12$	M1 A1
6(a)	$\text{Radius of semicircle} = \frac{12 - 2(2)}{2}$ $= 4 \text{ cm}$ <p>\therefore Area of $ABCDEF$</p> $= \left(\frac{1}{2} \times 12 \times 8 \right) - \left[\frac{1}{2} \times \pi (4)^2 \right]$ $= 22.867258$ <p>Volume = 22.867258×14</p> $= 320 \text{ cm}^3$	M1 A1



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6(b)	<p>Total surface area of prism</p> $= 2(22.867258) + 14[4\pi + 2 + 10 + 10 + 2]$ $= 557.66370$ <p>Cost = 557.66370×5.20</p> $= 2899.85$ <p>Alternative solution</p> $S.A = 2(22.867258)$ $+ 2(14 \times 10) + 2(14 \times 2)$ $+ \frac{1}{2}(2 \times 2\pi \times 4 \times 14)$ $= 557.6630$ <p>Cost = 557.66370×5.20</p> $= \$ 2899.85 / \2900	<p>M1, M1</p> <p>M1</p> <p>A1</p> <p>M1</p> <p>M1</p> <p>M1</p> <p>A1</p>
7(a)	$120 + 70 + 50 + 20 + 30 = 290$ tickets	B1
7(b)	<p>Amount collected from the ticket sales</p> $= 120 \times 10 + 70 \times 20 + 50 \times 30 + 20 \times 40 + 30 \times 50$ $= 1200 + 1400 + 1500 + 800 + 1500$ $= \$ 6400$	<p>M1</p> <p>A1</p>
7(c)	<p>Percentage of unoccupied seats</p> $\frac{350 - 290}{350} \times 100$ $= 17.1428.$ $= 17.1\% (3 \text{ s.f.}) \text{ or } 17\frac{1}{7}\%$	<p>M1</p> <p>A1</p>
8(a)	$p = 3$	B1
8(b)	<p>Axes, origin labelled</p> <p>Correct scale</p> <p>Correct plots + Straight line</p>	<p>B1</p> <p>B1</p> <p>B1</p>
8(c)	$x = 6$	B1
8(d)(i)	Correct $x = 3$ graph	B1
8(d)(ii)	$(3, 2.5)$	B1
9(a)(i)	$12x$	B1



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9(a)(ii)	$33(x-220)$ or $33x-7260$	B1
9(b)	$12x+33(x-220)=3540$ $12x+33x-7260=3540$ $45x-7260=3540(\text{shown})$	M1 M1
9(c)	$45x=12000$ $x=240$	B1
9(d)	$240-220=20$	B1

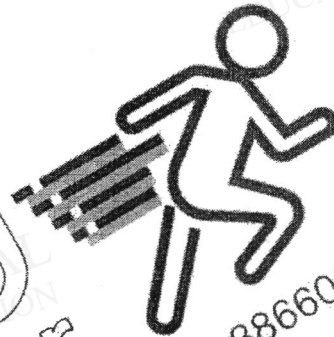


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