E

GAN ENG SENG SCHOOL
End-of-Year Examination 2016

CANDIDATE NAME	
CLASS	
INDEX NUMBER	

MATHEMATICS
Paper 1

4048/01

11th Oct 2016
1 hour

Sec 1 Express

Candidates answer on the Question Paper.

READ THESE INSTRUCTIONS FIRST

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

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 are NOT allowed.
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 3.142, unless the question requires the answer in terms of π.

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
Total	50

Answer **all** the questions.

1. (a) If one-fifth of 1260 is the same as $2^x \times 3^y \times 7^z$, write down the values of x, y and z.

Ans: (a) _____ [2]

(b) Find the smallest positive integer n for which $\sqrt[3]{2250n}$ is a whole number.

Ans: (b) $n =$ _____ [1]

2 (a) Arrange the following numbers in descending order.

$$0.\dot{6} \ , \ -6 \ , \ \frac{1}{6} \ , \ 0.666$$

Ans: (a) _____ [2]

2. (b) Without using a calculator, evaluate the following,

(i) $-7-(-5)+(-3)$,

Ans: (bi) _____ [1]

(ii) $(-2)^2 \div (-8) \times \frac{2}{5}$.

Ans: (bii) _____ [2]

(c) (i) Can $\frac{7}{15}$ be expressed as a terminating decimal or repeating decimal? [2]

Show or explain why.

(ii) Rewrite $0.\dot{3}\dot{4}$ as a fraction in its simplest form.

Ans: (cii) _____ [1]

3. (a) The length and breadth of a rectangular field, measured correct to 2 decimal places, are 29.35 m and 10.14 m respectively.

(i) Write down the least possible dimensions of the field.

Ans: (ai) _____ [2]

(ii) Estimate the area of the field, correct to 1 significant figure.

Ans: (aii) _____ m^2 [1]

(b) Estimate the value of $\frac{\sqrt[3]{345}}{\sqrt{80}}$.

Ans: (b) _____ [2]

4. (a) Simplify $2x \div 6 + 1 \times y$.

Ans: (a) _____ [2]

(b) Find the value of $\frac{x - xy}{xy + y}$, given $x = 2$ and $y = 3$.

Ans: (b) _____ [2]

(c) The average of 2 numbers is x. If a third number is added, the average is 6. Express the third number in terms of x.

Ans: (c) _____ [1]

5. (a) Simplify $-11x-2x+3x$.

Ans: (a) _____ [2]

(b) Factorise $18a+21ab-33ac$.

Ans: (b) _____ [2]

(c) Find the value of $789\times121-789\times111$.

Ans: (c) _____ [1]

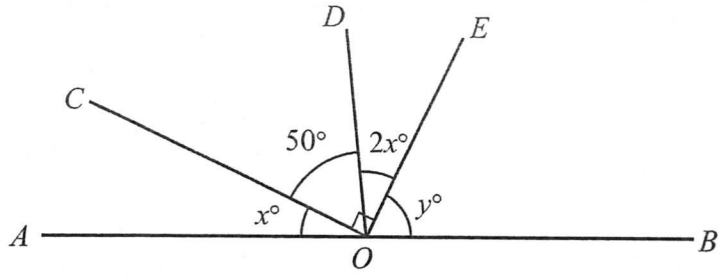
6. (a) Solve the equation $3(2x-1)+1=2(x+5)$.

Ans: (a) $x=$ _____ [3]

(b) Given the equation $\frac{5}{y-2}=\frac{4}{3y+1}$, find the value of y.

Ans: (b) $y=$ _____ [2]

7. (a) In the figure below, AOB is a straight line.



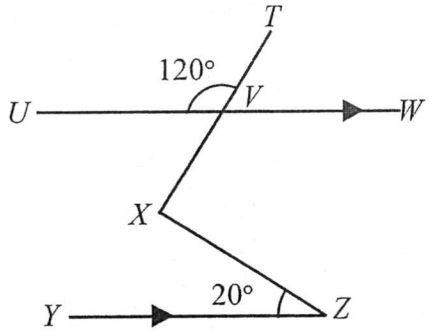
(i) Find the value of x, stating your reasons clearly.

Ans: (ai) $x =$ _____ [1]

(ii) Find the value of y, stating your reasons clearly.

Ans: (aii) $y =$ _____ [2]

7. (b) Find $\angle VXZ$ in the figure below, stating your reasons clearly.



Ans: (b) _____ ° [3]

8. (a) The first four terms of a sequence are 4, 7, 10 and 13.

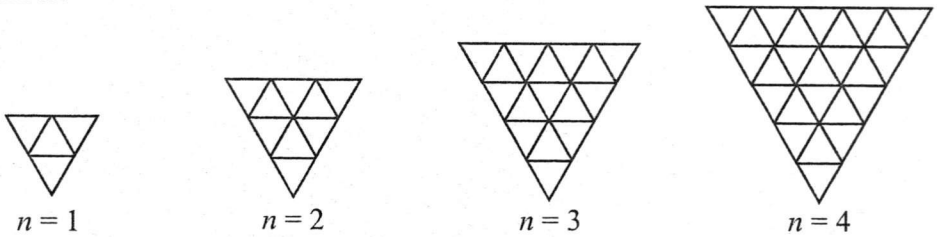
(i) Write down the next term of the sequence.

Ans: (ai) _____ [1]

(ii) The nth term of the sequence above can be expressed as $kn + 1$. Find the value of k.

Ans: (aii) $k =$ _____ [1]

(b) The diagram below shows a sequence of patterns, where n is the pattern number.



$n = 1$
(T_1) Number of Triangles = 4

$n = 2$
(T_2) Number of Triangles = 9

$n = 3$
(T_3) Number of Triangles = 16

$n = 4$
(T_4) Number of Triangles = 25

(i) Find the number of triangles when $n = 5$.

Ans: (bi) _____ [1]

(ii) Find the general term, T_n, in terms of n.

Ans: (bii) $T_n =$ _____ [1]

9. A square of side $2x$ is shaped from part or all of a string of length 68 cm.

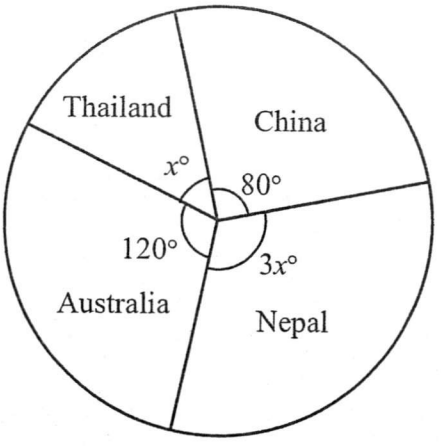
(a) Form an inequality in x and solve it.

Ans: (a) _____ [2]

(b) Hence or otherwise, write down the maximum integer value of x.

Ans: (b) $x =$ _____ [1]

10. (a) A group of Gessians were surveyed on which of the four countries they would like to visit the most for their overseas school trip. Their choices were represented on a pie chart given below.



(i) Find the value of x.

Ans: (ai) $x =$ _____ [1]

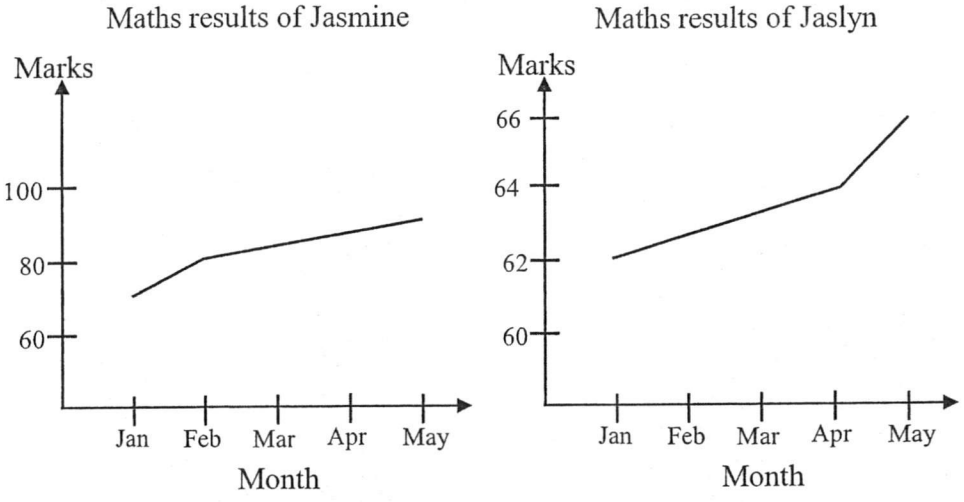
(ii) Hence, calculate the percentage of the group who like to visit Nepal the most.

Ans: (aii) _____ % [2]

(iii) If 40 Gessians would like to visit China the most, find the total number of Gessians surveyed.

Ans: (aiii) _____ [1]

10. (b) Two twin sisters, Jasmine and Jaslyn, chart their performance in the school Mathematics assessment for the first semester as shown in the following line graphs.



With a quick glance of the two graphs, the twin's mother commented that Jaslyn has done better than Jasmine. Do you think the mother is correct? Explain your answers. [2]

END OF PAPER

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	For Examiner 's Use
Total	50

Teacher's Copy
Marking Scheme

Answer **all** the questions.

1. (a) If one-fifth of 1260 is the same as $2^x \times 3^y \times 7^z$, write down the values of x, y and z.

1260 ÷ 5 = 252
Using ladder method,
$252 = 2^2 \times 3^2 \times 7^1$

2	252
2	126
3	63
3	21
	7

Marker's Comment
★ Deduct 1 mark for each wrong answers.

B2

Ans: (a) $x =$ **2** $y =$ **2** $z =$ **1** [2]

(b) Find the smallest positive integer n for which $\sqrt[3]{2250n}$ is a whole number.

$2250 = 2^1 \times 3^2 \times 5^3$
Smallest perfect cube
$= 2^3 \times 3^3 \times 5^3$
$n = 2^2 \times 3^1 = 12$

5	2250
5	450
5	90
3	18
3	6
	2

B1

Ans: (b) $n =$ **12** [1]

2 (a) Arrange the following numbers in descending order.

$$0.\dot{6} \ , \ -6 \ , \ \frac{1}{6} \ , \ 0.666$$

Covert all to decimals
0.66666… , –6, 0.166… , 0.666
In descending order
$0.\dot{6}$, 0.666 , $\frac{1}{6}$, -6

Marker's Comment
★ Deduct 1 mark for each pair of wrong answers.
★ No marks for more than 3 wrong answers.

B2

Ans: (a) $0.\dot{6}$, 0.666 , $\frac{1}{6}$, -6 [2]

2. (b) Without using a calculator, evaluate the following,

(i) $-7-(-5)+(-3)$,

$-7-(-5)+(-3)$

$=-7+5-3$

$=-5$ **B1**

Ans: (bi) **-5** [1]

(ii) $(-2)^2 \div (-8) \times \frac{2}{5}$.

$(-2)^2 \div (-8) \times \frac{2}{5}$

$= 4 \div (-8) \times \frac{2}{5}$ **M1**

$= -\frac{4}{8} \times \frac{2}{5} = -\frac{1}{2} \times \frac{2}{5}$

$= -\frac{1}{5}$ **A1**

Ans: (bii) **-1/5** [2]

(c) (i) Can $\frac{7}{15}$ be expressed as a terminating decimal or repeating decimal? [2]

Show or explain why.

It can be expressed as repeating decimal. **B1**

Students can divide 7 by 15, to get 0.46666... (repeating dec.) **B1**

(ii) Rewrite $0.\dot{3}\dot{4}$ as a fraction in its simplest form.

Let x be the repeating decimal, x = 0.3434...
100x = 34.3434...
100x – x = 34.3434... – 0.3434...
99x = 34
x = 34/99 **B1**

Ans: (cii) **34/99** [1]

3. (a) The length and breadth of a rectangular field, measured correct to 2 decimal places, are 29.35 m and 10.14 m respectively.

(i) Write down the least possible dimensions of the field.

Range of values of 29.35 rounded to 2dp
29.345 to 29.354999.... Ans: 29.345 **B1**
Range of values of 10.14 rounded to 2dp
10.135 to 10.13999.... Ans: 10.135 **B1**

Ans: (ai) **29.345 x 10.135** [2]

(ii) Estimate the area of the field, correct to 1 significant figure.

29.35 x 10.14
~= 30 x 10 (1sf)
= 300 **B1**

Ans: (aii) **300** m^2 [1]

(b) Estimate the value of $\frac{\sqrt[3]{345}}{\sqrt{80}}$.

$\frac{\sqrt[3]{345}}{\sqrt{80}} \approx \frac{\sqrt[3]{343}}{\sqrt{81}}$ **M1**

$= \frac{7}{9}$ **A1** **(or B2)**

Ans: (b) **7/9** [2]

4. (a) Simplify $2x \div 6 + 1 \times y$.

$2x \div 6 + 1 \times y$

$= \frac{x}{3} + 1 \times y$ **M1**

$= \frac{x}{3} + y$ **A1**

Ans: (a) **x/3 + y** [2]

(b) Find the value of $\frac{x - xy}{xy + y}$, given $x = 2$ and $y = 3$.

$\frac{x - xy}{xy + y}$

$= \frac{2 - (2)(3)}{(2)(3) + 3}$ **M1**

$= \frac{2 - 6}{6 + 3}$

$= \frac{-4}{9}$

A1

Ans: (b) **–4 / 9** [2]

(c) The average of 2 numbers is x. If a third number is added, the average is 6.

Express the third number in terms of x.

Let the 3rd number be y

Sum of 1st 2 numbers = $2x$

$\frac{2x + y}{3} = 6$

$2x + y = 18$

$y = 18 - 2x$ **B1**

Ans: (c) **18 – 2x** [1]

5. (a) Simplify $-11x-2x+3x$.

$-11x-2x+3x$ **M1**
$=-13x+3x$ **A1**
$=-10x$ **(or B2)**

Ans: (a) **$-10x$** [2]

(b) Factorise $18a+21ab-33ac$.

$18a+21ab-33ac$ **M1**
$=3(6a+7ab-11ac)$ **A1**
$=3a(6+7b-11c)$

Ans: (b) **$3a(6+7b-11c)$** [2]

(c) Find the value of $789\times121-789\times111$.

$789\times121-789\times111$
$=789(121-111)$
$=789(10)$ **B1**
$=7890$

Ans: (c) **7890** [1]

6. (a) Solve the equation $3(2x-1)+1=2(x+5)$.

$3(2x-1)+1=2(x+5)$ **M1**

$6x-3+1=2x+10$

$6x-2=2x+10$ **M1**

$6x-2x=10+2$

$4x=12$

$x=\frac{12}{4}$

$x=3$ **A1**

Ans: (a) $x=$ **3** [3]

(b) Given the equation $\frac{5}{y-2}=\frac{4}{3y+1}$, find the value of y.

$\frac{5}{y-2}=\frac{4}{3y+1}$ **M1**

$5(3y+1)=4(y-2)$

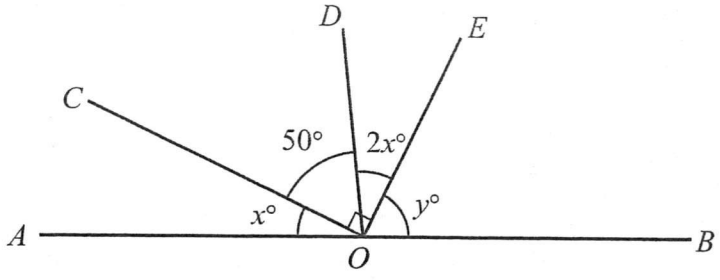
$15y+5=4y-8$

$11y=-13$

$y=-\frac{13}{11}$ or $-1\frac{2}{11}$ **A1**

Ans: (b) $y=$ **–13/11 or –1 2/11** [2]

7. (a) In the figure below, AOB is a straight line.



(i) Find the value of x, stating your reasons clearly.

$50° + 2x° = 90°$
$2x° = 90° - 50° = 40°$
$x° = 20°$ **B1**

Ans: (ai) $x = \mathbf{20}$ [1]

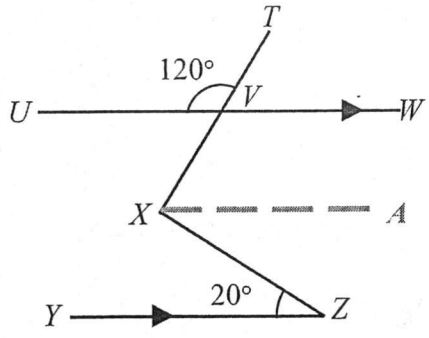
(ii) Find the value of y, stating your reasons clearly.

$x° + 50° + 2x° + y° = 180°$ (adj. $\angle$s on a st. line) **M1**
$20° + 50° + 2(20°) + y° = 180°$
$y° = 180° - 20° - 50° - 2(20°)$
$= 70°$ **A1**

Marker's Comment
★ Deduct 1 mark for whole paper if no properties given.

Ans: (aii) $y = \mathbf{70}$ [2]

7. (b) Find $\angle VXZ$ in the figure below, stating your reasons clearly.



$\angle WVX = 120°$ (vert. opp. $\angle$s) **M1**

Marker's Comment
★ Deduct 1 mark for whole paper if no properties given.

Draw and label line XA
$\angle AXZ = 20°$ (alt. $\angle$s, XA // to YZ)

$\angle AXV = 180° - \angle WVX$ (int. $\angle$s, UW // to XA)
$= 180° - 120°$
$= 60°$ **M1**

$\angle VXZ = \angle AXZ + \angle AXV$
$= 20° + 60°$
$= 80°$ **A1**

Ans: (b) **80 °** [3]

8. (a) The first four terms of a sequence are 4, 7, 10 and 13.

(i) Write down the next term of the sequence.

$4+3=7, 7+3=10, 10+3=13, 13+3=16$ **B1**

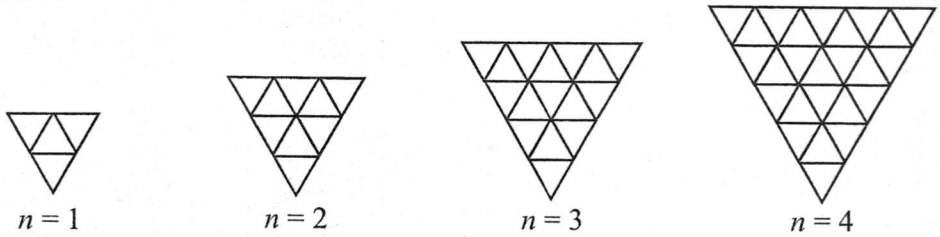
Ans: (ai) **16** [1]

(ii) The nth term of the sequence above can be expressed as $kn+1$. Find the value of k.

$k=3$. $3(1)+1=4, 3(2)+1=7, 3(3)+1=10, 3(4)+1=13$ **B1**

Ans: (aii) $k=$ **3** [1]

(b) The diagram below shows a sequence of patterns, where n is the pattern number.



$n=1$ (T_1) Number of Triangles = 4

$n=2$ (T_2) Number of Triangles = 9

$n=3$ (T_3) Number of Triangles = 16

$n=4$ (T_4) Number of Triangles = 25

(i) Find the number of triangles when $n=5$.

$6^2=36$ or sketch out the next diagram to count the triangles. **B1**

Ans: (bi) **36** [1]

(ii) Find the general term, T_n, in terms of n.

The square sequence $T_n=n^2 \Rightarrow 1, 4, 9, 16, 25, 36$

The required sequence $=4, 9, 16, 25, 36 \Rightarrow T_n=(n+1)^2$ **B1**

Ans: (bii) $T_n=$ **$(n+1)^2$** [1]

9. A square of side $2x$ is shaped from part or all of a string of length 68 cm.

(a) Form an inequality in x and solve it.

Perimeter $= 2x \times 4 = 8x$

$8x \leq 68$ **M1**

$x \leq \frac{68}{8}$ or $x \leq 8.5$ **A1**

Ans: (a) **$x \leq 8.5$** [2]

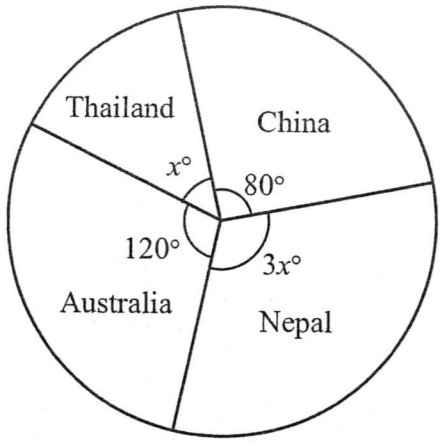
(b) Hence or otherwise, write down the maximum integer value of x.

$x \leq 8.5$

Max. integer $x = 8$ **B1**

Ans: (b) **$x = 8$** [1]

10. (a) A group of Gessians were surveyed on which of the four countries they would like to visit the most for their overseas school trip. Their choices were represented on a pie chart given below.



(i) Find the value of x.

$x+80+3x+120=360$

$4x=360-120-80=160$

$x=40$ **B1**

Ans: (ai) $x=$ **40** [1]

(ii) Hence, calculate the percentage of the group who like to visit Nepal the most.

$3x=3\times 40=120$ **M1**

$\text{Required percentage}=\frac{120}{360}\times 100\%$

$=\frac{100}{3}\%=33\frac{1}{3}\%$ or 33.3%(3sf) **A1**

Ans: (aii) **33 1/3 %** [2]

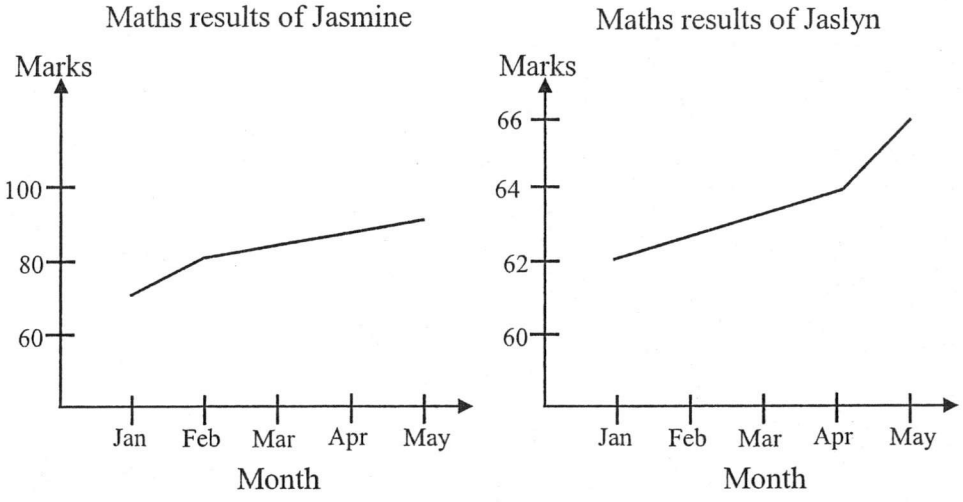
(iii) If 40 Gessians would like to visit China the most, find the total number of Gessians surveyed.

$\text{Required number}=\frac{40}{80}\times 360$

$=\frac{1}{2}\times 360=180$ **B1**

Ans: (aiii) **180** [1]

10. (b) Two twin sisters, Jasmine and Jaslyn, chart their performance in the school Mathematics assessment for the first semester as shown in the following line graphs.



With a quick glance of the two graphs, the twin's mother commented that Jaslyn has done better than Jasmine. Do you think the mother is correct? Explain your answers. [2]

No, the mother is not correct. **B1**

The scales of the vertical axis for the 2 graphs are different. The vertical scale on Jaslyn's graph is 10 times that of Jasmine's graph. Thus Jaslyn's graph looks bigger and steeper, giving the wrong impression that Jaslyn has done better than Jasmine. **B1**

END OF PAPER

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Answer Key

Q1a) $x = 2 \quad y = 2 \quad z = 1$
Q1b) $n = 12$

Q2a) $0.\dot{6}$, 0.666 , $\frac{1}{6}$, -6

Q2bi) – 5
Q2bii) -1/5
Q2ci) repeating decimal. divide 7 by 15, to get 0.46666…
Q2cii) 34/99

Q3ai) 29.345 x 10.135
Q3aii) 300 m^2
Q3b) 7/9

Q4a) $x/3 + y$
Q4b) –4 / 9
Q4c) $18 - 2x$

Q5a) $-10x$
Q5b) $3a(6 + 7b - 11c)$
Q5c) 7890

Q6a) $x = 3$
Q6b) $y = -13/11$ **or** $-1\ 2/11$

Q7ai) $x = 20$
Q7aii) $y = 70$
Q7b) 80 °

Q8ai) 16
Q8aii) $k = 3$
Q8bi) 36
Q8bii) $T_n = (n+1)^2$

Q9a) $x \leq 8.5$
Q9b) $x = 8$

Q10ai) $x = 40$
Q10aii) 33 1/3 %
Q10aiii) 180
Q10b) No, the mother is not correct. The scales of the vertical axis for the 2 graphs are different. The vertical scale on Jaslyn's graph is 10 times that of Jasmine's graph. Thus Jaslyn's graph looks bigger and steeper, giving the wrong impression that Jaslyn has done better than Jasmine.

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GAN ENG SENG SCHOOL
End of Year Examination 2016

CANDIDATE NAME

CLASS

INDEX NUMBER

MATHEMATICS
Paper 2

10 October 2016
1 hour 15 minutes

Sec 1 Express

Additional Materials: Writing Paper
Blank Paper
Graph Paper

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

1 Use a calculator to evaluate the following, leaving your answer correct to 3 decimal places. [1]

$$\left(\frac{\pi + 9.7}{-3.6}\right)^2$$

---

2 Find the highest common factor of the two numbers:

$2^7 \times 5 \times 7^3 \times 19^2$

$2^5 \times 3^3 \times 7^5 \times 19$

giving your answers as a product of its prime factors. [1]

---

3 The start of each lesson for schools is denoted by a chime. The table below shows the duration of a lesson.

School	**Duration of each period (in minutes)**
Gan Eng Seng School	35
Valley High School	49

Suppose the first chime rings at 07 30 daily for both schools, find the time when the chimes will next ring together. [3]

---

4 *Ekko* charges petrol at x cents per litre. Mr. Ng was charged y dollars when he went there to pump one day. Express the number of litres Mr. Ng pumped in terms of x and y. [2]

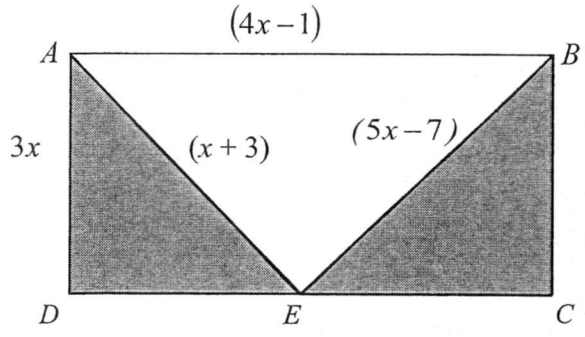
5 Simplify

(a) $10a+13b-2(a+b)$, [2]

(b) $\dfrac{c+4d}{2}+\dfrac{2c-5d}{3}$. [3]

---

6 The figure below shows a rectangle $ABCD$ with sides $AD=3x$ cm and $AB=(4x-1)$ cm.



(a) Given that triangle AEB is an isosceles triangle where the sides $AE=(x+3)$ cm and $BE=(5x-7)$ cm are of equal lengths, by forming an equation, find the value of x. [2]

(b) Using your answer in (a), calculate the area of the shaded part of the figure. [3]

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7 Mr. Sea walks a distance of 3.5 km at an average speed of 6 km/h and takes a break for 20 minutes before continuing to jog a distance of 1.2 km in 8 minutes. Calculate

(a) the time taken for Mr. Sea to walk 3.5 km in minutes, [2]

(b) his jogging speed in km/h, [1]

(c) his average speed for the entire journey in km/h. [2]

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8 Mr. Teng took his family to *Tony Mamas* for his wife's birthday. The following shows a receipt from the restaurant.

Tony Mamas 1 Suntec Boulevard #01-49 S(123456) Tel: 6987 5432	
Order#: 117 Date: 8/8/2016 7.45 PM Server: Ah Lian	Table 34
2 steak salad	25.00
5 calamari	44.50
2 fish & chips	35.80
3 New York cheesecake	20.70
Total 12 item(s)	**(a)**
Service charge (10%)	
GST (7%)	
GRAND TOTAL	**(b)**

(a) Calculate the total cost of the 12 items. [2]

(b) A service tax of 10 % was imposed on the cost of the dishes served followed by the 7 % GST. Calculate the grand total for this bill, correcting your answer to the nearest cent. [2]

(c) Mr. Teng forgot to present his *Tony Mamas* VIP card which entitles him to a 15% discount on the Grand Total. Calculate the amount of discount Mr. Teng should have received, correcting your answer to the nearest cent. [2]

9 The ratio of an interior angle to an exterior angle of a regular polygon with n sides is 7:2.

(a) Find the value of n and name the regular polygon. [3]

(b) Find the sum of interior angles in this regular polygon. [2]

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10 Answer the whole of this question on a sheet of **PLAIN** paper.

Quadrilateral $ABCD$ is a piece of land used for a parade performance. The organisers of the parade wanted to determine the best location for the fireworks display such that spectators in the vicinity will have a good view.

(a) Given that $AB = 9$ cm, $\angle BAD = 85^o$, $AD = 7$ cm, $\angle ABC = 75^o$ cm and $CD = 6.8$ cm, construct the model of quadrilateral $ABCD$.
You may wish to start the construction with line segment AB in the middle of the paper [4]

(b) The fireworks were launched at two different venues. At the first venue, the fireworks travel along the perpendicular bisector of AB; and the second venue, the fireworks travel along the angle bisector of $\angle ADC$.

Construct the perpendicular bisector and the angle bisector on the same diagram to illustrate the paths of the fireworks from both venues. [2]

(c) The best location X for the fireworks display is where the angle bisector of $\angle ADC$ meets the perpendicular bisector of AB. Identify and label this point X. [1]

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11 Answer the whole of this question on a sheet of **GRAPH** paper.

The table below shows some values for the equation $2y + 3x = 6$.

x	-1	a	2	4
y	4.5	3	0	b

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

(b) Using a scale of 2 cm to represent 1 unit for both axes, plot the graph $2y + 3x = 6$ for $-1 \leq x \leq 4$. [2]

(c) Using your graph, find

(i) the value of x when $y = -1.5$, [1]

(ii) the value of y when $x = 1.5$, [1]

(iii) The value of c if the point $(3, 2c)$ lies on the straight line, $2y + 3x = 6$. [1]

(d) Find the gradient of the line $2y + 3x = 6$. [1]

(e) On the same axes, draw the graph $y = 2$. [1]

(f) State the number of intersection point(s) between the lines $2y + 3x = 6$ and $y = 2$. [1]

END OF PAPER

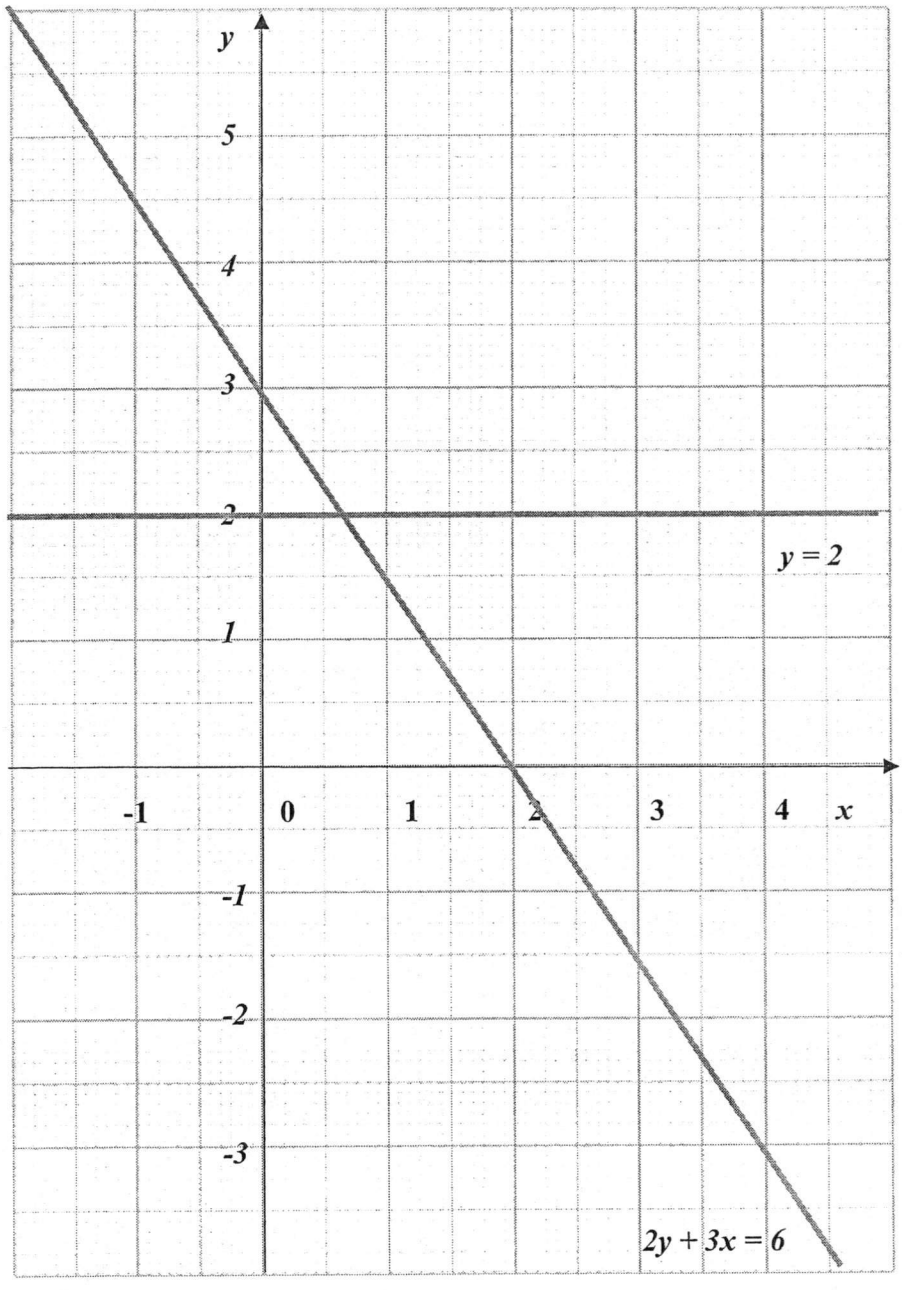
1 EXPRESS EOY PAPER 2 MARK SCHEME

1			$\left(\frac{\pi+9.7}{-3.6}\right)^2 = 12.724\,2$ $= 12.724\ (3d.p.)$	[B1]
2			$HCF = 2^5 \times 7^3 \times 19$	[B1]
3			7 | 35 | 49 5 | 5 | 7 7 | 1 | 7 | 1 | 1 $LCM = 5 \times 7^2$ $= 245\ min$ $= 4h\ 5 min$ Next time = 07 30 → 4h 5 min = 1135	[M1] for correct ladder method [M1] for LCM [A1]
4			$x\ cents \rightarrow 1\ litre$ $1\ cent \rightarrow \frac{1}{x}\ litre$ $100y\ cents \rightarrow \frac{1}{x} \times 100y$ $= \frac{100y}{x}\ litres$	[M1] [A1] or [B2]

5	(a)		$10a+13b-2(a+b)$ $=10a+13b-2a-2b$ $=8a+11b$	[M1] for change of operators [A1] or [B2]
	(b)		$\frac{c+4d}{2}+\frac{2c-5d}{3}$ $=\frac{3c+12d}{6}+\frac{4c-10d}{6}$ $=\frac{7c+2d}{6}$	[M2] for the change of common denominator for each fraction [A1]
6	(a)		Length AE = Length BE $x+3=5x-7$ $4x=10$ $x=2.5cm$	[M1] for forming equation [M1] for value of x
6	(b)		**Method 1** Area of unshaded triangle $=\frac{1}{2}bh$ $=\frac{1}{2}(3x)(4x-1)$ $=\frac{1}{2}(3\times2.5)(4\times2.5-1)$ $=33.75cm^2$ Area of rectangle $=lb$ $=(3x)(4x-1)$ $=(3\times2.5)(4\times2.5-1)$ $=67.5cm^2$ Area of shaded part $=67.5-33.75$ $=33.75cm^2$	[M1] for area of unshaded triangle [M1] for area of rectangle [A1]

			Method 2 Area of shaded part $=\frac{1}{2}bh$ $=\frac{1}{2}(3x)(4x-1)$ $=\frac{1}{2}(3\times 2.5)(4\times 2.5-1)$ $=33.75cm^2$	[M2] [A1]
7	**(a)**		Time taken $=\frac{Distance}{Speed}$ $=3.5\div 6$ $=\frac{7}{12}h$ $=35min$	[M1] [A1]
	(b)		Jogging Speed $=\frac{Distance}{Time}$ $=1.2\div\frac{8}{60}$ $=9km/h$	[B1]
	(c)		Average Speed $=\frac{Total\ Distance}{Total\ Time}$ $=(3.5+1.2)\div\left(\frac{7}{12}+\frac{8}{60}+\frac{20}{60}\right)$ $=4\frac{10}{21}km/h$ $=4.4761km/h\ (5s.f.)$ $=4.48km/h\ (3s.f.)$	[M1] allow ECF [A1]

8	**(a)**		Total Cost $= 25 + 44.5 + 35.8 + 20.7$ $= \$126$	[B1]
	(b)		$100\% \rightarrow \$126$ $10\% \rightarrow \frac{126}{100} \times 10$ $= \$12.60$ $100\% \rightarrow \$138.60$ $107\% \rightarrow \frac{138.60}{100} \times 107$ $= \$148.302$ $= \$148.30 (\textit{nearest cent})$	[M1] [A1]
	(c)		Amount of discount $= \frac{15}{100} \times 148.302$ $= \$22.2453$ $= \$22.25$ (*nearest cent*)	[M1] [A1]
9	**(a)**		Int. Angle + Ext. Angle $= 180$ $7x + 2x = 180$ $9x = 180$ $x = 20$ 1 Ext. Angle $= 2x$ $= 2(20)$ $= 40^o$ No. of sides $= \frac{360^o}{1 \text{ Ext. Angle}}$ $= \frac{360^o}{40}$ $= 9$ Name of regular polygon = Nonagon	[M1] [A1] [B1] Note: No marks awarded for incorrect spelling

	(b)		Sum of int. angles $=(n-2)\times 180$ $=(9-2)\times 180$ $=1\,260^{o}$	[M1] [A1]
10			**LAST PAGE**	
11	**(a)**		$a=0$ $b=-3$	[B1] [B1]
	(b)		 [B1] for correct plotting of points [B1] for correct scale, labelling of axes and equations.	

	(c)	**(i)**	x= 3.0 (accept 2.9 to 3.1)	
		(ii)	y = 0.65 to 0.85	
		(iii)	c = - 0.7 to - 0.8	
	(d)		Gradient $= -\frac{3}{2}$ *or* $-1\frac{1}{2}$ *or* -1.5	[B1]
	(e)		**On the graph**	
	(f)		There is 1 point of intersection.	[B1]

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