Name: _____ Index Number: _____

Class: _____

Clementi Town Secondary School
End-of-Year Examination 2011
Secondary 1 Express

Mathematics
Paper 1 **1 hour**

Additional Materials provided : Writing Paper for rough working

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READ THESE INSTRUCTIONS FIRST

Do not open the booklets until you are told to do so.
Write your name, register number and class on all the work you hand in.
Write in dark blue or black pen on both sides of the answer paper.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer all the questions.

Write your answers in the spaces provided on the question paper.
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 TO BE USED IN THIS PAPER.

The number of marks is given in brackets [ ] at the end of each question or part question.
The total number of marks for this paper is **50**.

FOR EXAMINER'S USE
50

This question paper consists of 7 printed pages, including this cover page.

[Turn over]

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Answer **all** the questions in the spaces provided.

1 Estimate $10.45 \times \sqrt{22.2}$, giving your answer correct to one significant figure.

Answer ..... [2]

2 Evaluate the following $34-4\times(28-30)+2$.

Answer ..... [2]

3 Write down a simple fraction which is halfway between $\frac{4}{7}$ and $\frac{5}{7}$, in the form of $\frac{a}{b}$.

Answer ..... [2]

4 Given that $3a = 4b$, find the ratio of $a : b$.

Answer ..... [2]

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

Answer ..... [2]

6 Given that a and b are integers such that $2 < a \leq 5$ and $-3 \leq b \leq 2$, find

(a) the greatest possible value of ab^2,

(b) the least possible value of $\frac{1}{a}+\frac{1}{b}$.

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

(b) ..... [1]

7 The average speed of a car for the first 1 hour of its journey is 80 km/h. The driver made a 1 hour stopover for petrol and lunch. Its average speed for the remaining 2 hours is 100 km/h. Find its average speed for the whole journey.

Answer .....km/h [2]

8 The first four terms of a sequence are 6, 10, 14, 18, ...

(a) Write down the next term in the sequence.

(b) Write down the n^{th} term in the sequence.

(c) Write down the 100^{th} term in the sequence.

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

(b) ..... [1]

(c) ..... [1]

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9 Solve the following equations

(a) $-3(2-5x)=9$,

(b) $\frac{2}{3}y-3=3$.

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

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

---

10 **(a)** Expand and simplify $c-3(3c-2)$.

(b) Factorise completely $d+2de-2f-4ef$.

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

(b) ..... [2]

---

11 A polygon has n sides. Two of its exterior angles are 21° and 54°.

The remaining $(n-2)$ exterior angles are 15° each. Find

(a) the value of n,

(b) the sum of interior angles of the polygon.

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

(b) ..... [2]

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12 **(a)** Express 80 as a product of its prime factors, giving your answer in index notation.

(b) Find the smallest positive integer k such that $80k$ is a perfect square.

(c) Find the value of $\sqrt[3]{80\times100}$.

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

(b) ..... [1]

(c) ..... [2]

13 In a certain polling station, there were 1 000 voters.

(a) During the General Election, 20% of them failed to cast their votes. Calculate the number of people who voted.

(b) During the Presidential Election, there was a percentage increase of 12.5% in the number of people who voted. Calculate the number of people who voted.

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

(b) ..... [2]

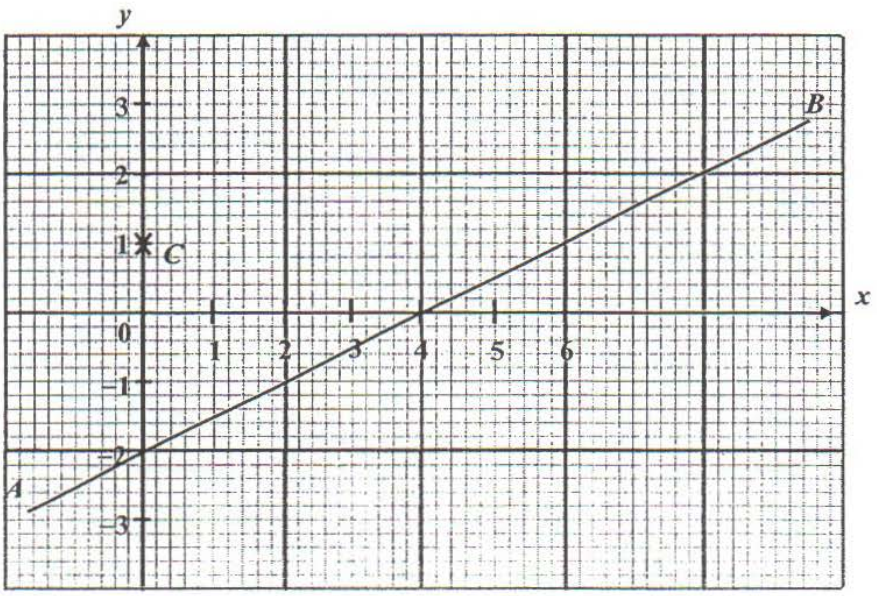
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14 The graph below shows a straight line AB.

(a) Write down the coordinates of point C.

(b) Find the gradient of AB.

(c) Write down the equation of the line that is parallel to AB and pass through point C.



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

(b) ..... [2]

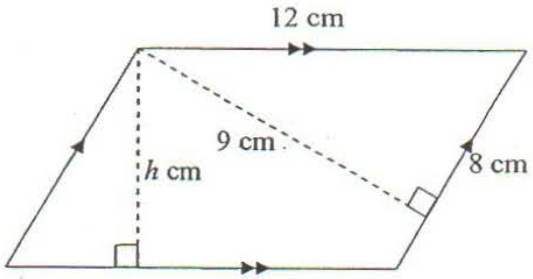
(c) ..... [1]

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15 In the figure, *ABCD* is a parallelogram. Calculate

(a) the area of the parallelogram,

(b) the value of h.



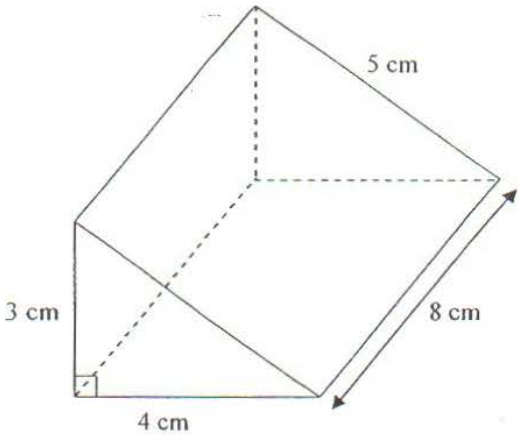
Answer *(a)* .....cm² [2]

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

16 The solid shown below is a prism. Find the

(a) volume of the prism,

(b) total surface area of the prism.



Answer *(a)* .....cm³ [2]

(b) .....cm² [2]

- End of paper -

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2011 1EXP

1) 50

2) 44

3) $\frac{9}{14}$

4) $a:b=4:3$

5) $-6\frac{4}{5}$

6a) 45

6b) $-\frac{4}{5}$

7) Average speed $= 70km/h$

8a) 22

8b) $4n+2$

8c) 402

9a) $x=1$

9b) $y=9$

10a) $-8c+6$

10b) $(d-2f)(1+2e)$

11a) $n=21$

2011 1EXP EOY Exam P1 A

11b) 3420°

12a) $80=2^4\times5$

12b) 5

12c) 20

13a) 800

13b) $P=900$

14a) (0, 1)

14b) gradient of AB $=\frac{1}{2}$

14c) $y=\frac{1}{2}x+1$

15a) Area of parallelogram $=72cm^2$

15b) $h=6$

16a) Volume of prism $=48cm^3$

16b) Total surface area of prism
$=108cm^2$

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Name : _____ Index Number : _____

Class : _____

Clementi Town Secondary School
End-of-Year Examination 2011
Secondary 1 Express

MATHEMATICS
Paper 2 **1 hour 30 minutes**

Additional Materials provided : Writing Paper, Graph Paper and Plain Paper

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

Answer all the 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 number of marks for this paper is **50**.

For Examiner's Use
50

This Question Paper consists of 5 printed pages.

[Turn over

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Answer **all** the questions.

1. Solve the following equations

(a) $3x = \frac{2}{7}$, [1]

(b) $\frac{3x}{4} - \frac{x+2}{3} = 1$. [3]

2. There are three numbers such that the second is three times the first and the third is three less than four times the first. It is given that x is the first number and the sum of the three numbers is 37.

(a) Write down an algebraic expression for the second and third numbers. [2]

(b) Form an equation connecting the three algebraic expressions. [1]

(c) Solve the equation and find the three numbers. [2]

3. **(a)** It is given that $V = 2\pi\sqrt{l^2 + h^2}$. Given that $\pi = 3.142$, $l = 20$ and $h = 9.8$, calculate the value of V to 3 **significant figures**. [2]

(b) Subtract the sum of $\frac{a}{3}$ and $\frac{b}{4}$ from $2(a - b)$. [2]

4. Answer the following questions by referring to the advertisement below

Multi system Hi Fi Player

Cash
Original Price : **$2 500**

NOW: $1 798

or
$55 monthly instalments x **38 months**
$200 DEPOSIT!

(a) Find the percentage discount for payment in cash compared to the original price, giving your answer correct to one decimal place. [3]

(b) What is the difference between the instalment price and payment by cash? [2]

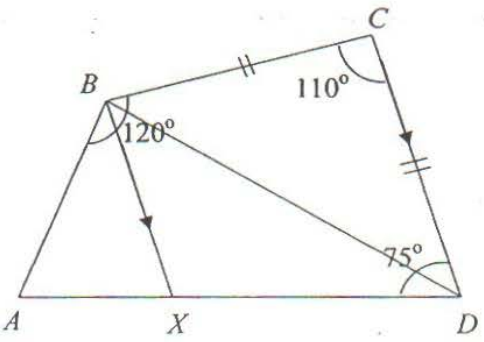
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5. (a) (i) Solve $\frac{5m}{6} \geq \frac{7}{3}$. [2]

(ii) If m is an integer, what is the smallest value of m? [1]

(b) Ariff wants to buy pizzas for his birthday party. If one pizza costs \$19, find the maximum number of pizzas Ariff can buy if he has \$350. [2]

6.



In the diagram, $ABCD$ is a quadrilateral in which $\angle ABC = 120°$, $\angle BCD = 110°$, $\angle CDA = 75°$ and $BC = CD$. Point X is on AD is such that BX is parallel to CD.

Calculate

(a) $\angle BAX$, [2]

(b) $\angle BDX$, [2]

(c) $\angle BXD$. [2]

7. **Answer the whole of this question on a sheet of plain paper.**

(a) Construct a triangle ABC such that $AB = BC = 7$ cm and $AC = 9$ cm. [3]

(b) Measure and write down the size of $\angle BAC$. [1]

(c) Construct the angle bisector of $\angle BAC$. [1]

(d) Construct the perpendicular bisector of AC. [1]

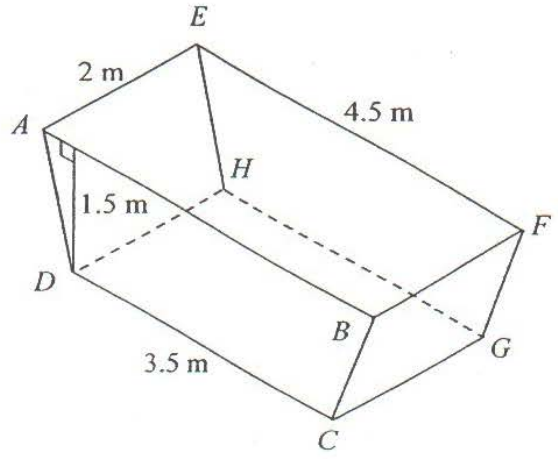
(e) Label the point of intersection of the 2 bisectors from (c) and (d) as M. Measure and write down the length of AM. [1]

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8. In a factory, waste liquid is poured into cylindrical drums. The area of the base of each drum is 0.2 m^2 and its height is 90 cm.

(a) Calculate the volume of each drum, giving your answer in m^3. [2]

When each drum is full, the waste liquid is emptied into a tank as shown below.
ADHE, ABFE and *DCGH* are rectangles, while *ABCD* and *EFGH* are trapeziums.
EF = 4.5 m, *DC* = 3.5 m, *AE* = 2 m and the perpendicular height of the tank is 1.5 m.



(b) Calculate

(i) the area of the trapezium *ABCD*, [2]

(ii) the volume of the tank. [2]

(c) How many full drums of waste can be emptied into the tank? [1]

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

The table below shows the corresponding x and y values for the equation $y = -2x + 1$.

x	-2	-1	0	1	2
y	p	3	1	q	-3

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

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

(c) On the same axes, draw and label the line $x = 1.5$. [1]

(d) From the graph drawn, write down the coordinates of the point of intersection of $x = 1.5$ and $y = -2x + 1$. [1]

END OF PAPER

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Answer Key

1 (a) $x = \frac{2}{21}$

1 (b) $x = 4$

2 (a) Second number is 3x
Third number is 4x – 3.

2 (b) $x + 3x + 4x - 3 = 37$

2 (c) The three numbers are 5, 15 and 17.

3 (a) V = 140 (3 sig. fig.)

3 (b) $\frac{20a - 27b}{12}$

4 (a) Percentage discount = $\frac{702}{2500} \times 100\%$ = 28.1%

4 (b) Difference = \$2290 - \$1798 = \$492

5 (a)(i) $m \geq 2\frac{4}{5}$ or 2.8 [A1]

5 (a)(ii) Smallest value of *m* is 3

5 (b) Maximum number of pizzas is 18.

6 (a) $\angle BAX = 360° - 120° - 110° - 75°$ (sum of interior angles in a quadrilateral)
$= 55°$

6 (b) $\angle BDX = 75° - 35°$ (sum of angles)
$= 40°$

6 (c) $\angle BXD = 180° - 35° - 40°$ (angle sum of triangle)
$= 105°$

7 See attached.

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8(a)	Vol of each drum $= 0.2 \times 0.9$ $= 0.18\ \text{m}^3$	M1 A1
8(b)(i)	Area of trapezium $ABCD$ $= \frac{1}{2}(3.5 + 4.5) \times 1.5$ $= 6\ \text{m}^2$	M1 A1
8(b)(ii)	Vol of tank $= 6 \times 2$ $= 12\ \text{m}^3$	M1 A1
8(c)	$\frac{12}{0.18} = 66\frac{2}{3}$ 66 full drums can be emptied into the tank	B1

9 See attached.

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