Name :

Class	Register Number

DUNEARN SECONDARY SCHOOL
Mid-Year Examination 2014
Mathematics
Paper 2

Secondary 1 Express

Thursday 8th May 2014 0800 - 0930 1 hour 30 minutes

INSTRUCTIONS TO CANDIDATES

Write your name, class and register number in the spaces at the top of this page.
Answer **all** questions.
Write your answers on the writing paper or graph paper provided.
All working must be shown. Omission of essential working will result in loss of marks.
Do not use any highlighters, correction fluid or correction tape for the paper.

INFORMATION FOR CANDIDATES

Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place in the case of angles in degrees, unless a different level of accuracy is specified in the question.
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 60.
The use of an electronic calculator is expected where appropriate.
You are reminded of the need for clear presentation in your answers.
For π, use either your calculator value or 3.142, unless the question requires the answer in terms of π.

PARENT'S SIGNATURE

FOR EXAMINER'S USE
60

Setter: Mr Khairi

This question paper consists of 5 printed pages, including this cover page.

Answer all the questions. Show your workings clearly.

1 (a) Arrange the following in ascending order [1]

$$0.12\dot{5}, \frac{1}{\sqrt{8}}, 0.13, 0.1\dot{2}\dot{5}.$$

(b) From the numbers given in (a), write down the irrational number(s). [1]

2 Solve $\frac{1}{2x} - \frac{1}{2} = 4.5$. [2]

3 Given that $x : y = 0.3 : 0.5$ and $y : z = \frac{1}{7} : \frac{1}{2}$,

(a) simplify $x : y$ and $y : z$, [2]

(b) find $x : y : z$. [1]

4 Three bus services are scheduled to leave Bukit Batok bus interchange at regular intervals of 6 minutes, 15 minutes and 20 minutes respectively. Given that the three bus services leave the bus interchange together at 3 pm, determine the time when the three bus services next leaves the bus interchange together. [3]

5 Andrew walks at an average speed of 0.6 m /s for 25 minutes.

(a) Convert 0.6 m/s to km/h. [1]

(b) Calculate the distance covered by Andrew in km. [2]

6 Cindy invests $4000 in a savings scheme that pays 1.5% simple interest per annum.

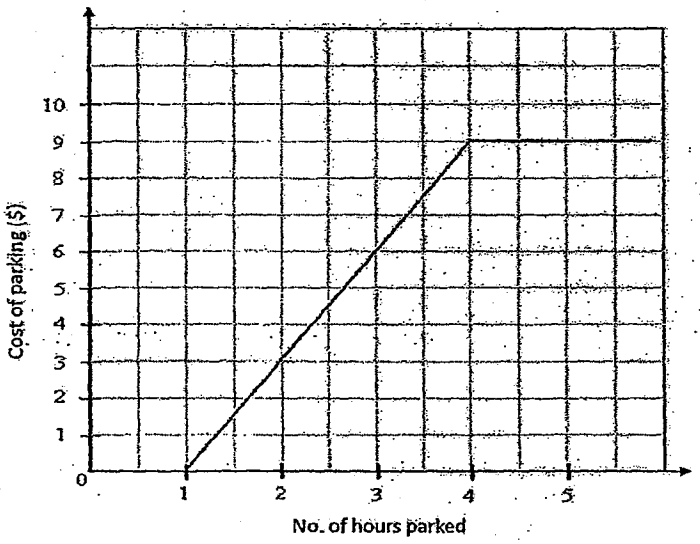
(a) Find the interest Cindy receives for each year. [1]

(b) Calculate the time taken for Cindy's investment to reach $4300. [2]

7 (a) Evaluate $5-\left[-\frac{7}{4}+(-\frac{35}{16})\times\frac{2}{7}\right]$, giving your answer in its simplest form. **Show all workings clearly.** [3]

(b) Estimate the value of $\frac{10.44\times0.103}{4.982}$, by rounding off the numbers in the expression to 2 significant figures. [2]

8 The following diagram shows the graph of parking charges in a shopping mall for a 24-hour period.



Find

(a) the number of minutes of free parking offered by the carpark, [1]

(b) the duration a person left his car in the carpark if he pays $6, [1]

(c) the cost of parking if he parks his car for 4.5 hours, [1]

(d) the rate of parking charges (per hour) between 1 to 4 hours. [2]

9 (a) Expand and simplify $4x-4(x+3)$. [2]

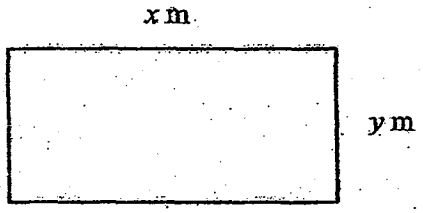
(b) Solve $\frac{7x}{3(x+5)}=\frac{1}{6}$. [3]

10 Siti bought x pencils for \$30 and 4 pens for \$$y$.

(a) Write an algebraic expression in terms of x for the price of one pencil. [1]

(b) Find an algebraic expression in terms of x and y for the cost of 2 pencils and 8 pens. Factorise your answer fully. [4]

11 The diagram shows a garden with dimension x m by y m, where x and y are positive integers. When the measurements are corrected to the nearest 10 m, the garden measures 200 m by 110 m.



Find

(a) the smallest possible perimeter of the garden, [3]

(b) the largest possible area of the garden. [2]

12 Angela is 3 times as old as Derek and the sum of their present ages is 52. Let Derek's present age be x.

(a) Express Angela's present age in terms of x. [1]

(b) Form an equation in terms of x and solve this equation. [2]

(c) **Hence**, find Angela's age 3 years ago. [2]

13 (a) During a search-and-rescue operation, a helicopter at a height of 90 m above sea level, spots an unidentified object directly below it. The unidentified object is 4 m below sea level. Find the distance between the helicopter and the unidentified object. [1]

(b) The table shows the temperatures in 2 cities on Tuesday.

Cities	***X***	***Y***
Temperature in the morning (°C)	29.7	−15.6
Temperature in the afternoon (°C)	33.4	−12.1

(i) Find the average temperature of these two cities in the morning. [2]

(ii) Determine which city experienced a greater change in temperature from morning to afternoon. Support your answer with clear workings shown. [3]

Answer the whole of question 14 on a sheet of graph paper.

14 (a) Using a scale of 1 cm to represent 1 unit on the x-axis for $-7 \leq x \leq 5$ and 1 cm to represent 1 unit on the y-axis for $-1 \leq y \leq 9$, draw and label the quadrilateral $PQRS$ whose vertices are P $(-6, -1)$, Q $(-4, 3)$, R $(1, 8)$ and S $(1, 6)$. [3]

(b) Find the gradient of the line segment QR. [2]

(c) Write down the coordinates of the point where the line QR cuts the y-axis. [1]

(d) **Hence**, write down the equation of the line QR. [1]

(e) State the equation of the line RS. [1]

END OF PAPER

Secondary 1E EM MYE 2014
Paper 2 Marking Scheme

No.	Solution	Marks	Remarks
1a	$0.1\dot{2}\dot{5}, 0.12\dot{5}, 0.13, \frac{1}{\sqrt{8}}$	B1	No marks if $\frac{1}{\sqrt{8}}$ is written as 0.3536
1b	$\frac{1}{\sqrt{8}}$	B1	No marks if $\frac{1}{\sqrt{8}}$ is written as 0.3536.
Marker's report:			

2	$\frac{1}{2x}-\frac{1}{2}=4.5$ $\frac{1}{2x}-\frac{x}{2x}=4.5$ $\frac{1-x}{2x}=4.5$ $1-x=9x$ $1=10x$ $x=\frac{1}{10}$	M1 A1	Accept 0.1 OR $\frac{1}{2x}-\frac{1}{2}=4.5$ $\frac{1}{2x}=4.5+\frac{1}{2}$ $\frac{1}{2x}=5$ $1=10x$ $x=\frac{1}{10}$	 M1 A1
Marker's report:				

3a	$x:y$ $0.3:05$ $3:5$ $y:z$ $\frac{1}{7}:\frac{1}{2}$ $2:7$	B1 B1	
3b	$x:y:z$ $3:5$ $2:7$ $6:10:35$	B1	
Marker's report:			

4	<table><tr><td>2</td><td>6, 15, 20</td></tr><tr><td>5</td><td>3, 15, 10</td></tr><tr><td>3</td><td>3, 3, 2</td></tr><tr><td>2</td><td>1, 1, 2</td></tr><tr><td></td><td>1, 1, 1</td></tr></table> LCM of 6, 15 and 20 = 60 3 pm + 60 minutes = 4 pm	 M1 M1 A1	Accept listing method : 6: 6, 12, 18, …, **60** 15: 15, 30, 45, **60** 20: 20, 40, **60** LCM of 6, 15 and 20 = 60 3 pm + 60 minutes = 4 pm	M1 M1 A1
Marker's report:				

5a	$0.6\text{ m/s} = \frac{0.6 \div 1000}{1 \div 3600}$ $= 2.16\text{ km/h}$	B1	Accept $2\frac{4}{25}$
5b	$\text{distance} = \text{speed} \times \text{time}$ $= 2.16 \times \frac{25}{60}$ $= 0.9\text{ km}$	M1 A1	Accept $\frac{9}{10}$
Marker's report:			

6a	$\text{Interest} = \frac{PRT}{100}$ $= \frac{4000 \times 1.5 \times 1}{100}$ $= \$60$	 B1	
6b	$\$4300 - \$4000 = \$300$ $\frac{300}{60} = 5\text{ years}$	M1 A1	
Marker's report:			

7a	$5 - [-\frac{7}{4} + (-\frac{35}{16}) \times \frac{2}{7}] = 5 - (-\frac{7}{4} - \frac{5}{8})$ $= 5 + \frac{19}{8}$ $= 7\frac{3}{8}$	M1 M1 A1	Accept7.375

7b	$\frac{10.44\times 0.103}{4.982}=\frac{10\times 0.10}{5.0}$ $=\frac{1}{5}$	M1 A1	No M1 awarded if students write '5' or '0.1' Accept 0.2
Marker's report:			

8a	60 minutes	B1	
8b	3 hours	B1	
8c	\$9	B1	
8d	$\text{rate}=\frac{\$9}{3hr}$ $=\$3/hr$	M1 A1	Accept \$3/hr – B2. Students should also be able to obtain the answer by examining the graph. This would require a higher understanding of the concept of rate.
Marker's report:			

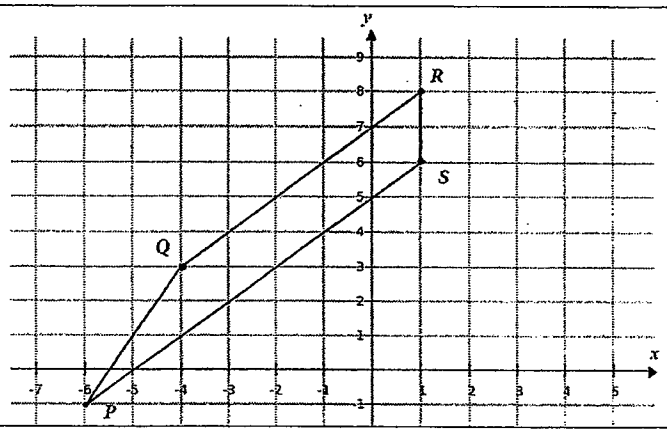
9a	$4x-4(x+3)=4x-4x-12$ $=-12$	M1 A1	
9b	$\frac{7x}{3(x+5)}=\frac{1}{6}$ $42x=3(x+5)$ $42x=3x+15$ $39x=15$ $x=\frac{5}{13}$	M1 M1 A1	
Marker's report:			

10a	$\$\left(\frac{30}{x}\right)$	B1	
10b	Cost of 2 pencils and 8 pens $=\$\left(\frac{30}{x}\times 2\right)+\$\left(\frac{y}{4}\times 8\right)$ $=\$\left(\frac{60}{x}\right)+\$(2y)$ $=\$2\left(\frac{30}{x}+y\right)$	 M1, M1 M1 A1	
Marker's report:			

11a	$2x+2y=2(x+y)$ $=2(195+105)$ $=600\,\text{m}$	M1 M1 A1	M1 for formula of perimeter M1 for 195 and for 105
11b	Largest possible area $=204\times114$ $=23256\,\text{m}$	M1 A1	M1 for 204 and for 104
Marker's report:			

12a	$3x$	B1	
12b	$3x+x=52$ $4x=52$ $x=13$	M1 A1	
12c	$3x-3=3(13)-3$ $=36$	M1 A1	
Marker's report:			

13a	$90\,\text{m}-(-4)\,\text{m}$ $=94\,\text{m}$	B1	
13bi	$\frac{29.7+(-15.6)}{2}=7.05°\text{C}$	M1,A1	
13bii	City *X*: $33.4-29.7=$ $3.7°\text{C}$ City *Y*: $-12.1-(-15.6)=3.5°\text{C}$ Hence, City *X*.	 M1 M1 A1	
Marker's report:			

14a		D1 – for all correct points D1 – range of x and y-axis D1 – scale and labeling of *PQRS* and axes	

14b	$gradient = \frac{8-3}{1-(-4)}$ $= 1$	M1 A1	
14c	(0,7)	B1	
14d	$y = x + 7$	B1	
14e	x=1	B1	
Marker's report:			

— == End of Mark Scheme == —