Class:	Candidate Name:	Candidate Index Number:

SHUQUN SECONDARY SCHOOL

2012 Mid-Year Examination
Secondary 1 Express

MATHEMATICS

Paper 1 — 9 May 2012

Candidates answer on the Question Paper — **1 Hour 30 Minutes**

INSTRUCTIONS TO CANDIDATES

Write your name, class and class index number in the spaces at the top of this page and all the work you hand in.
Write in 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.

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

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, 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 marks for this paper is **50**.

This question paper consists of **9** printed pages.

[Turn over

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Answer **all** questions.

1. Write down the following numbers in order of size, starting with the smallest.

$0.42, \quad 0.4\dot{2}\dot{8}, \quad 0.\dot{4}\dot{2}, \quad 0.\dot{4}2\dot{8}$

Ans: _____ [1]

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2. Consider the following numbers:

$$\sqrt{2}, \quad -5, \quad 3^3, \quad 0.\dot{2}\dot{3}, \quad \sqrt{25}, \quad \pi$$

List down all the possible

(a) prime number(s),

(b) irrational number(s).

Ans: (a) _____ [1]

(b) _____ [1]

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3. Express 106.038

(a) correct to 1 decimal place,

(b) correct to 2 significant figures.

Ans: (a) _____ [1]

(b) _____ [1]

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4. Evaluate each of the following:

(a) $\dfrac{\frac{3}{4}-3\frac{1}{2}}{2\frac{1}{3}\times\left(-\frac{3}{2}\right)+\frac{1}{4}}$,

(b) $\sqrt{\frac{3}{4}\times\frac{6}{11}\div 1\frac{7}{8}}$.

Ans: (a) _____ [1]

(b) _____ [1]

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5. Find the HCF of 28, 56 and 84.

Ans: _____ [2]

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6. Estimate $\dfrac{\sqrt{24.96}\times 19.98}{(0.0203)^2\times\sqrt[3]{9.11}}$, giving your answer correct to 1 significant figure.

Ans: _____ [2]

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7. The length of the sides of a triangle ABC are in the ratio $AB : BC : CA = 3 : 5 : 8$. Given that AB is 12 cm, find the perimeter of the triangle ABC.

Ans: _____ cm [2]

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8. (a) Express 0.25% as a fraction.

(b) Express 45 cm as a percentage of 12 m.

Ans: (a) _____ [1]

(b) _____ % [2]

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9. Given that $a = -3, b = 2$ and $c = 6$, evaluate:

(a) $2a - 3bc$,

(b) $b(2a + 3)$,

(c) $\frac{ab - c^2}{3a}$.

Ans: (a) _____ [1]

(b) _____ [1]

(c) _____ [1]

---

10. Factorise the following completely:

(a) $3y^2 - xy^2$,

(b) $pq + 2rs - 2ps - rq$.

Ans: (a) _____ [1]

(b) _____ [2]

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11. Noel is x years old. His sister, Rachel, is 5 years younger than him. His mother is three times as old as him. His father is 28 years older than Rachel.

Write down an expression for

(a) Rachel's age,

(b) the sum of his parent's age.

Ans: (a) _____ years old [1]

(b) _____ years old [2]

---

12. Ryan leaves his house at 0657 and reaches school at 0715 on a particular day. The distance between his house and the school is 3.24 km. Find Ryan's average speed in m/s.

Ans: _____ m/s [3]

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13. Simplify each of the following:

(a) $-27p \div (-9) \times (-2q)$,

(b) $3(x + 4) + 5(2x - 1)$.

Ans: (a) _____ [1]

(b) _____ [2]

---

14. A rectangular sign board measures 3.04 m by 5.12 m.

(a) Find the area of the board correct to 3 significant figures.

(b) The cost per square metre of the board is \$52.70. Find the cost of the board correct to the nearest dollar.

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

(c) \$ _____ [2]

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15. Express each of the following ratios in its simplest form.

(a) 40 cm : 2 m ,

(b) $1.2 : \frac{2}{5} : \frac{4}{25}$:

Ans: (a) _____ : _____ [2]

(b) _____ : _____ : _____ [2]

---

16. Express

(a) \$31.20/min in cents/sec,

(b) $5\frac{1}{2}$ m/s in km/h.

Ans: (a) _____ cent/s [2]

(b) _____ km/h [2]

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17. Alan works 8 hours per day, 5 days a week. His daily salary is $128.

(a) How much is his hourly salary rate?

(b) How much is his weekly salary rate?

Ans: (a) $_____ [2]

(b) $_____ [2]

---

18. Mr Lim's monthly basic salary is $1200. He is also given a commission of 4% of the value of sales he made per month. Mr Lim receives a basic salary rise of 5% this year.

(a) How much is his basic salary this year?

(b) If he aims to get $3500 this month, what is the value of sales he has to make?

Ans: (a) $_____ [2]

(b) $_____ [2]

End of Paper

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Class:	Candidate Name:	Candidate Index Number:

SHUQUN SECONDARY SCHOOL

2012 Mid-Year Examination
Secondary 1 Express

MATHEMATICS

Paper 2

10 May 2012

Additional Material: Answer Paper

1 Hour 30 Minutes

INSTRUCTIONS TO CANDIDATES

Write your name, class and class index number in the spaces at the top of this page and all the work you hand in.
Write in blue or black pen.
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Answer **all** questions.

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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 marks for this paper is **50**.

This question paper consists of **4** printed pages.

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Answer **all** questions.

1. (a) Factorise $5x + 5y$. [1]

   (b) Hence, without using calculator, evaluate $(5 \times 2.775 + 5 \times 0.225)$. [2]

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2. (a) Rachel bought 2 erasers at \$0.99 each and 3 pens at \$2.99 each. The shopkeeper asked for \$12.80. By using estimation, show that the amount asked is wrong. [2]

   (b) Given that $255 \times 35 = 8925$, without using calculator, find (25.5×3.5). [2]

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3. Jasmine bought a book at \$32.10 inclusive of GST.

   (a) Calculate the amount of GST. (Given that GST is 7%) [2]

   (b) She was given a 20% discount before the GST and the shopkeeper still earned a profit of 20%. Calculate the profit the shopkeeper would have earned before the discount. [3]

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4. (a) The numbers A, B and C, expressed as products of their prime factors are given below.

   $A = 2^5 \times 3^2 \times 5^3 \times 17$
   $B = 2^4 \times 3^3 \times 7^2 \times 17^3$
   $C = 2^5 \times 3^4 \times 17^2$

   (i) Find the LCM of A, B and C. Leave your answer in index notation. [1]

   (ii) Given than $B \times D$ is a perfect cube, find the smallest value of D. [2]

   (b) (i) Express 140 as a product of prime factors. Leave your answer in index notation. [1]

   (ii) Given that the LCM of 14 and an integer m is 140. Find the smallest value of m. [2]

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5. Simplify the following:

(a) $8x - [4x - 3(2x - 1)]$, [3]

(b) $\frac{2x^2y^3}{3} \times \frac{5xz^3}{8} \div \frac{25x^5y^2z}{16}$, [2]

(c) $y - \frac{4 - 2y}{3} - \frac{y - 5}{6}$. [3]

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6. (a) Given that x has a range of values from -1 to 7 and y has a range of values from -4 to 2, find

(i) the largest value of $\frac{x}{y}$, [1]

(ii) the smallest value of $\sqrt[3]{xy^2}$. [2]

(b) What must be added to $-1\frac{3}{4}$ to make $\left(\frac{2}{5}\right)^2$? [2]

(c) The mass of a bottle with water is 5.59 kg when it is $\frac{4}{5}$ full. The bottle weighs 1.15 kg when it is empty. Find the mass of water when it is half full. [3]

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7. (a) Add $(2x^2 - 3xy)$ to the sum of $(5x^2 - 8xy)$ and $(xy - 5)$. [2]

(b) Mangoes are sold at x cents each. Oranges are sold at 5 for \$$y$. Apples are each sold at 50 cents cheaper than each mango.

(i) Express the cost of an orange in dollars in terms of y. [1]

(ii) Express the cost of an apple in dollars in terms of x. [1]

(iii) Express the cost of 20 apples, 15 oranges and 3 mangoes in dollars in terms of x and y. Simplify your expression. [2]

(iv) Given that $x = 95$ and $y = 2.40$, find the cost for 20 apples, 15 oranges and 3 mangoes. [2]

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8. (a) Mr Lim was supposed to pick his son from school at 14 15 on a particular day. He left house at 13 38 and arrived at school 10 minutes later than scheduled time. How long was his journey from home to school? [2]

(b) Joey used to travel from city A to city B at an average speed of 70 km/h. The distance between the two cities is 210 km. On a particular day, she drove faster than her usual speed. If her new travelling time to her old travelling time is in the ratio of 5 : 6, calculate how much time she would save. Leave your answer in minutes. [3]

(c) 5 bakers take 20 minutes to bake 15 pieces of cake. How many pieces of cake can 8 bakers bake in 60 minutes? [3]

End of Paper

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Secondary School Exam Papers

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Mark Scheme for P1 Mathematics 1E MYE 2012

Item No.	Solution	Marks	Remarks
1	$0.42,\quad 0.\dot{4}\dot{2},\quad 0.4\dot{2}\dot{8},\quad 0.\dot{4}2\dot{8}$	B1	Correct order
2(a)	$\sqrt{25}$	B1	
2(b)	π , $\sqrt{2}$	B1	Any order
3(a)	106.0 (1 decimal places)	B1	
3(b)	110 (2 s.f.)	B1	
4(a)	$\frac{11}{13}$ or 0.846 (3 s.f.)	B1	
4(b)	0.467 (3 s.f.)	B1	
5	2 | 28, 56, 84 2 | 14, 28, 42 7 | 7, 14, 21 1, 2, 3 HCF = $2 \times 2 \times 7 = 28$	M1 A1	
6	$\approx \frac{\sqrt{25} \times 20}{0.02^2 \times \sqrt[3]{8}}$ $= 125000$ $\approx 100000\ (1\ s.f.)$	M1 A1	
7	$3\ units \rightarrow 12\ cm$ $1\ unit \rightarrow 4\ cm$ $Total\ units = 3 + 5 + 8 = 16\ units$ $Perimeter = 16 \times 4$ $= 64\ cm$	M1 A1	
8(a)	$\frac{1}{400}$	B1	

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8(b)	$\frac{45}{1200} \times 100\%$ $= 3\frac{3}{4}\%$ or 3.75%	M1 A1	
9(a)	-42	B1	
9(b)	-6	B1	
9 (c)	$4\frac{2}{3}$ or 4.67 (3 s.f.)	B1	
10(a)	$y^2(3-x)$	B1	
10(b)	$= pq - 2ps + 2rs - rq$ $= p(q-2s) + r(2s-q)$ $= p(q-2s) - r(q-2s)$ $= (q-2s)(p-r)$ or $= pq - rq - 2ps + 2rs$ $= q(p-r) - 2s(p-r)$ [M1] $= (q-2s)(p-r)$ [A1]	 M1 A1	
11(a)	$x - 5$	B1	
11(b)	Mother's age = $3x$ Father's age = $x + 23$ Sum = $3x + x + 23$ $= 4x + 23$	M1 A1	Any of these
12	07 15 − 06 57 = 18 min = 1080 sec Average speed = $\frac{3240}{1080}$ $= 3$ m/s	M1 M1 A1	
13(a)	$-6pq$	B1	
13(b)	$= 3x + 12 + 10x - 5$ $= 13x + 7$	M1 A1	
14(a)	15.6 m^2	B1	

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14(b)	Cost = \$52.70 × 15.5648 m^2 = \$820.26496 ≈\$820	M1 A1	
15(a)	40 cm : 200 cm 1 : 5	M1 A1	
15(b)	1.2 : 0.4 : 0.16 120 : 40 : 16 15 : 5 : 2	M1 A1	Any one
16(a)	$= \frac{3120\ cents}{1 \times 60\ sec}$ $= 52\ cents/sec$	M1 A1	
16(b)	$= \frac{5\frac{1}{2}}{1000} \div \frac{1}{3600}$ $= 19\frac{4}{5}\ km/h$	M1 A1	
17(a)	$8\ hours \rightarrow \$128$ $1\ hour \rightarrow \frac{128}{8} = 16$ Hourly rate = \$16	M1 A1	
17(b)	$1\ day \rightarrow \$128$ $1\ week \rightarrow 5\ days$ $1\ week \rightarrow 128 \times 5 = 640$ Weekly rate = \$640	 M1 A1	
18(a)	$1200 \times \frac{105}{100}$ = \$1260	M1 A1	
18(b)	\$3500 − \$1260 = \$2240 4% → \$2240 $1\% \rightarrow \frac{\$2240}{4} = \$560$ 100% → \$560 × 100 He must sell \$56,000.	 M1 A1	

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Mark Scheme for P2 Mathematics 1E MYE 2012

Item No.	Solution	Marks	Remarks
1(a)	$= 5(x + y)$	B1	
1(b)	$= 5(2.775 + 0.225)$ $= 5(3)$ $= 15$	M1 A1	
2(a)	$\approx 2(1) + 3(3)$ $= \$11$	M1 A1	
2(b)	$25.5 \times 3.5 = \frac{255}{10} \times \frac{35}{10}$ $= \frac{255 \times 35}{100}$ $= 89.25$	 M1 A1	
3(a)	$107\% \rightarrow 32.10$ $7\% \rightarrow \frac{32.10}{107} \times 7$ GST amount = \$2.10	 M1 A1	

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3(b)	Sales price before GST = \$32.10 - \$2.10 = \$30 At discount of 20%, 80% → 30 $100\% \rightarrow \frac{30}{80} \times 100$ Sales price before discount = \$37.50 At profit of 20%, 120% → 30 $100\% \rightarrow \frac{30}{120} \times 100$ Cost price = \$25 Profit = \$37.50 − \$25 = \$12.50	M1 M1 A1	Either one
4(ai)	LCM = $2^5 \times 3^4 \times 5^3 \times 7^2 \times 17^3$	B1	
4(aii)	$B \times D = 2^6 \times 3^3 \times 7^3 \times 17^3$ (perfect cube) $B = 2^4 \times 3^3 \times 7^2 \times 17^3$ $D = 2^2 \times 7$ $= 28$	M1 A1	
4(bi)	$140 = 2^2 \times 5 \times 7$	B1	
4(bii)	LCM = $140 = 2^2 \times 5 \times 7$ $14 = 2 \times 7$ Smallest $m = 2^2 \times 5 = 20$	M1,A1	
5(a)	$= 8x - [4x - 6x + 3]$ $= 8x - [-2x + 3]$ $= 8x + 2x - 3$ $= 10x - 3$	M1 M1 A1	
5(b)	$= \frac{2x^2y^3}{3} \times \frac{5xz^3}{8} \times \frac{16}{25x^5y^2z}$ $= \frac{4yz^2}{15x^2}$	M1 A1	

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5(c)	$= \frac{6y - 2(4 - 2y) - (y - 5)}{6}$ $= \frac{6y - 8 + 4y - y + 5}{6}$ $= \frac{9y - 3}{6}$ $= \frac{3(3y - 1)}{6}$ $= \frac{3y - 1}{2}$	M1 M1 A1	
6(ai)	$x = -1, 0, 1, 2, 3, 4, 5, 6, 7$ $y = -4, -3, -2, -1, 0, 1, 2$ largest $\frac{x}{y} = \frac{7}{1} = 7$	B1	
6(aii)	smallest $\sqrt[3]{xy^2} = \sqrt[3]{-1 \times (-4)^2}$ $= -2.51$	M1 A1	
6(b)	$= \left(\frac{2}{5}\right)^2 - \left(-1\frac{3}{4}\right)$ $= \frac{191}{100}$	M1 A1	
6(c)	Water's mass $= 5.59 - 1.15 = 4.44$ kg 4 parts $\rightarrow$ 4.44 5 parts $\rightarrow \frac{4.44}{4} \times 5 = 5.55$ Water's mass when half full $= \frac{5.55}{2}$ $= 2.775$ kg	M1 M1 A1	

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7(a)	$(5x^2 - 8xy) + (xy - 5) + (2x^2 - 3xy)$ $= 7x^2 - 10xy - 5$	M1 A1	
7(bi)	$\$\frac{y}{5}$	B1	
7(bii)	$\$\frac{x - 50}{100}$	B1	
7(biii)	$= 20\left(\frac{x - 50}{100}\right) + 15\left(\frac{y}{5}\right) + 3\left(\frac{x}{100}\right)$ $= \$(0.23x + 3y - 10)$	M1 A1	
7(biv)	Cost $= 0.23(95) + 3(2.4) - 10$ $= \$19.05$ Alternatively, $cost\ of\ 1\ apple = \frac{95 - 50}{100} = 0.45$ $cost\ of\ 1\ orange = \frac{2.4}{5} = 0.48$ $cost\ of\ 1\ mango = \frac{95}{100} = 0.95$ Total cost $= 20(0.45) + 15(0.48) + 3(0.95)$ $= \$19.05$	M1 A1	
8(a)	14 15 – 13 38 = 37 min Total time = 37 + 10 = 47 min	M1 A1	
8(b)	Old time taken $= \frac{210}{70} = 3$ hours 6 units → $3 \times 60 = 180$ min 5 units → $\frac{180}{6} \times 5 = 150$ min Time saved = 180 – 150 = 30 min	M1 M1 A1	

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8(c)	No. bakers	No. minutes	No. cake			
	5	20	15			
	1	20	$\frac{15}{5} = 3$		M1	
	1	60	$3 \times \frac{60}{20} = 9$		M1	
	8	60	$9 \times 8 = 72$		A1	

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