Name: _____( ) Class: _____

DAMAI SECONDARY SCHOOL
MID-YEAR EXAMINATION 2011

50

Secondary One Express

MATHEMATICS PAPER 1

Friday, 6 May 2011 **8.15 am – 9.30 a.m.** **1 hour 15 minutes**

INSTRUCTIONS TO CANDIDATES

Write your full name, register number and class in the spaces provided on the cover of this question paper.

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

All answers are to be written on the question paper in the spaces provided.

All necessary working must be shown the space below the respective question. **Omission of essential working will result in loss of marks.**

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.**

Calculators may be used in this paper.

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1. Round off 21.973 to
   (a) 1 decimal place
   (b) 3 significant figures

Answer: (a) _____ [1]

(b) _____ [1]

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2. From the following set of numbers,

$$-4 \quad -\frac{1}{3} \quad 1 \quad \sqrt{2} \quad 1.2 \quad 2.\dot{4} \quad 81 \quad \pi$$

Write down:
(a) all the perfect square(s)
(b) all the recurring decimal(s)
(c) all the irrational number(s)

Answer: (a) _____ [1]

(b) _____ [1]

(c) _____ [1]

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3. Using prime factorisation, express 195 as a product of prime factors.

Answer: _____ [2]

---

4. John is scuba-diving 14 metres *below* sea level whereas Darren is flying on a plane directly above John at an altitude of 982 metres. What is the vertical distance between them?

Answer: _____m [2]

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5. The table shows the temperature of 4 cities on a particular day.

London	New York	Beijing	Singapore
7°C	-1 °C	-8°C	27°C

(a) Which is the coldest city?
(b) What is the difference in New York and London's temperature?
(c) The temperature of Sydney is exactly midway between the temperatures in Singapore and London. What is the temperature of Sydney?

Answer: (a) _____ [1]

(b) _____ ^{0}C [2]

(c) _____ ^{0}C [2]

---

6. Evaluate, using calculator

(a) 24 – (-6) + 20 ÷ 5 , giving your answer to the nearest 10.

(b) $\dfrac{3\frac{3}{7}\times\frac{14}{12}}{-1\frac{2}{3}+\frac{2}{5}}$, giving your answer correct to 3 decimal places.

Answer: (a) _____ [2]

(b) _____ [2]

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7. Allan went shopping for stationery. He bought x pens at \$1.75 each and y books at \$2.50 each.

(a) How much money, in dollars, in terms of x and y, did Allan spend altogether?

(b) Given $x = 3$ and $y = 5$, what would be his *change*, in dollars, if he paid with a \$50 note?

Answer: (a) \$_____ [1]

(b) \$_____ [2]

---

8. Simplify the following expressions.

(a) $3 \times (-11a)$

(b) $-2x + 8y - 7x + 0.5y$

(c) $2(3 + 2a) + 7(a + 2)$

Answer: (a) _____ [1]

(b) _____ [2]

(c) _____ [2]

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9. (a) Solve the following equations.

(i) $8m + 11 = 17 + 5m$

(ii) $\frac{m}{5} - 1 = -2$

(b) Simplify $\frac{3m+5}{4} + \frac{3-m}{2}$

Answer: (ai) _____ [1]

(aii) _____ [2]

(bi _____ [3]

---

10. Given that $a = 4.5$, $b = 0$, $c = -3$ and $d = 8$, evaluate

(a) $d + 2c$

(b) $\frac{4a}{c} - bd$

Answer: (a) _____ [1]

(b) _____ [2]

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11. Factorise the following expressions

(a) $4m-12$,
(b) $ap+2aq-ar$,
(c) $d(2e-f)-3g(2e-f)$.

Answer: (a) _____ [1]

(b) _____ [1]

(c) _____ [1]

12. Arrange the following in descending order.

$0.5\dot{3}$, 0.33, $\frac{1}{3}$, $\frac{1}{2}$

Answer: _____ [2]

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13. Given that $7056 = 2^a \times 3^b \times 7^c$, find the values of a, b and c using prime factorisation.

Answer: a = _____, [1]

b = _____, [1]

c = _____. [1]

---

14. Complete the pattern below

(a) −8 , −5 , _____ , 1 , 4 , 7 , _____

(b) 1, 1, 2, 3, 5, 8, 13, _____, 34...

Answer: (a) _____ and _____ [2]

(b) _____ [1]

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15. The pictogram below shows the different modes of transport that students in Damai Secondary take to go to school every morning.

Walk	☺ ☺ ☺ ◖
MRT	☺ ☺ ☺ ☺ ☺
Bus	
Car	☺ ☺
Taxi	☺ ◖

Each ☺ represents 4 students.

(a) How many students walk to school?

(b) Complete the above diagram if **10** students take bus to school. [2]

(c) Which is the most popular mode of transport?

Answer: (a) _____ [1]

(b) See diagram

(c) _____ [1]

- End of Paper –

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Answer Scheme

1a) 22.0 1b) 22.0

2a) 1, 81 2b) $2.\dot{4}$ 2c) $\sqrt{2}, \pi$

3) 3x 5x 13

4) 996 m

5a) Beijing 5b) 8°C 5c) 17°C

6a) 30 (to nearest tens) 6b) - 3.158

7a) $\$(1.75x + 2.5y)$ 7b) $32.25

8a) $-33a$ 8b) $8.5y - 9x$ 8c) $11a + 20$

9ai) 2 9aii) -5 9b) $\frac{m+11}{4}$

10a) 2 10b) -6

11a) $4(m-3)$ 11b) $a(p+2q-r)$ 11c) $(2e-f)(d-3g)$

12) 0.5, $\frac{7}{14}$, $\frac{1}{3}$, 0.33

13) 4, 2, 2

14a) −2 , 10 . 14b) 21

15a) 14 students

15b)



15c) MRT

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DAMAI SECONDARY SCHOOL
MID-YEAR EXAMINATION 2011

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Secondary One Express

MATHEMATICS PAPER 2

Thursday, 12 May 2011 **8.15 am – 9.45 a.m. 1 hour 30 minutes**

INSTRUCTIONS TO CANDIDATES

Write your full name, register number and class in the spaces provided on the cover of this question paper.

Answer **ALL** questions.
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Answer **ALL** questions.

1. (a) Three bells toll at 5 minutes, 8 minutes and 24 minutes respectively. If they first toll together at 09 04, at what time will they toll together again?

(b) The length, breadth and height of an open rectangular container are 90 cm, 45 cm and 30 cm respectively. Suppose identical cubes are placed within the container such that they fill up the container completely.

Using H.C.F, calculate,

(i) in cm, the greatest possible length of each cube,

(ii) in cm^3, the volume of each cube,

(iii) using answer from (bi) & (bii), how many cubes are placed inside the rectangular container?

Answer:(a) _____ [3]

(bi) _____cm [2]

(bii) _____ cm^3 [1]

(biii) _____cubes [1]

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2. (a) Evaluate $\frac{1.11 \times 2^2}{0.3^3}$ and express your answer as a **recurring** decimal.

(b) An airplane descended 150m from an altitude of 8382m and then ascended 110m immediately. What was the final altitude that the airplane was flying?

(c) Using prime factorisation, find the cube root of $\sqrt[3]{42875}$.

(d) There were 540 passengers in the airplane. $\frac{3}{5}$ of the passengers were men, $\frac{1}{3}$ were women and the rest are children. How many more men are there than children?

Answer: (a) _____ [1]

(b) _____ m [2]

(c) _____ [2]

(d) _____ [3]

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3. (a) Sue Ann is x years old now. Write an algebraic expression for
   (i) her age 6 years later
   (ii) the present age of her uncle who was 5 times older than her 2 years ago.

   (b) Simplify the following expressions.
   (i) $(-4b+5c)+(2b-6c)$

   (ii) $4p+2[3p+2(-3q)]$

Answer: (ai) _____ years [1]

(aii) _____ years [2]

(bi) _____ [2]

(bii) _____ [3]

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4. (a) Subtract $(-2a^2 + 3b - 5c)$ from $(7a^2 - 2b - 4c)$.

(b) The three sides of a triangle is $(7d + 3e)$ cm, $(2d + 3e - 1)$ cm and $(d - 2e + 10)$ cm.
Find the perimeter of the triangle.

Answer: (a) _____ [2]

(b) _____ cm [2]

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5. (ai) Solve $3.5x + 1 > 8$.

(aii) Hence, write down the smallest prime number which satisfies the inequality.

(b) Solve the following equations.

(i) $3x = 18$

(ii) $2(2x - 1) = 6$

(iii) $\frac{30}{y+3} = 5$

(iv) $\frac{x}{3} + \frac{2x}{5} = 11$

Answer: (ai) _____ [2]

(aii) _____ [1]

(bi) _____ [1]

(bii) _____ [2]

(biii) _____ [2]

(biv) _____ [3]

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6. (a) Write down the next two terms of each sequence.

$\frac{1}{4}, -\frac{1}{16}, \frac{1}{64}, ____, ____$.

(b) The small triangle as shown in Figure A is the building block for the rest of the figures to its right. T_n denotes the number of building blocks in the n^{th} figure in the sequence. **For example, $T_2 = 4$ and $T_3 = 9$.**

Figure A



T_1 T_2 T_3 T_4

(i) Determine T_4 and T_5.
(ii) Find the general term T_n in terms of n.
(iii) Which figure in the sequence will have 256 triangular building blocks in it?

Answer: (a) _____and_____ [2]

(bi) T_4 = _____[1]

T_5 = _____[1]

(bii) T_n = _____[1]

(biii) _____ [1]

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7. 40 students in a class travel to school everyday either by bus, train, bicycle, car or walking. The frequency table shows the number of students going in each mode.

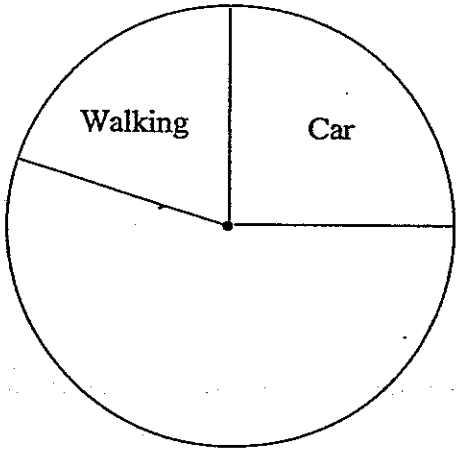
Mode of travel	Bus	MRT	Bicycle	Car	Walking
Frequency	4	12	6	10	8

(a) Complete the pie chart below for the above results.

(b) What is the most popular mode of transport?

(c) Calculate the angle representing the number of students who travel to school by car.

Answer: (a) [3]



(b) _____ [1]

(c) _____ ° [2]

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Answer scheme

1a) 11 04 1bi) 15cm 1bii) 3375 cm3 1biii) 36 cubes

2a) $164.\dot{4}$ 2b) 8342 m 2c) 35 2d) 288

3ai) $(x+6)$ years old 3aii) $(5x-8)$ years old 3bi) $-2b-c$ 3bii) 10p-12q

4a) $\left(9a^2-5b+c\right)$ (b) $\left(10d+4e+9\right)$ cm

5ai) $x>2$ 5aii) 3 bi) 6 bii) 2 biii) 3 biv) 15

6a) $-\frac{1}{256}, \frac{1}{1024}$ 6b) $T_4=16$ and $T_5=25$ bii) $T_n=n^2$ biii) Fig 16

7b) MRT 7c) 90^0

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