Class	Register Number	Name

南洋女子中学校

NANYANG GIRLS' HIGH SCHOOL

Mid-Year Examination 2014
Secondary One

INTEGRATED MATHEMATICS 1 hour

PAPER 1

Monday 12 May 2014 **0845 - 0945 hrs**

READ THESE INSTRUCTIONS FIRST

INSTRUCTIONS TO CANDIDATES

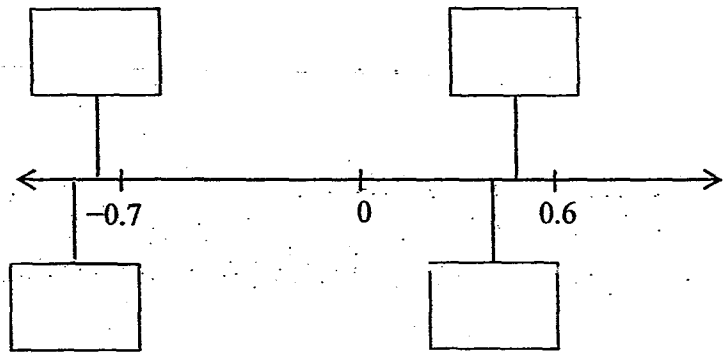
1. Write your name, register number and class in the spaces at the top of this page.
2. Answer all the questions from number 1 to 8.
3. Write your answers in the spaces provided on the question paper.
4. If working is needed for any question, show it in the space below that question. All working must be written in ink.
5. **Omission of essential working will result in loss of marks.**
6. **Electronic calculators are NOT allowed for this paper.**

INFORMATION FOR CANDIDATES

1. The number of marks is given in brackets [ ] at the end of each question or part question.
2. The total number of marks for this paper is 40.
3. You are reminded of the need for **clear presentation** in your answers.

1. Place each of the following numbers in the correct box which indicates its position on the number line given below: [2]

$$-\frac{3}{4}, 0.5\dot{6}, -0.7\dot{5}, \frac{5}{9}$$



2. (a) Given the polynomial $4y^2 - 8y + 3$, write down the

(i) the coefficient of y,

(ii) the constant term.

(b) Given that $a = -8$, $b = 2$ and $c = -1$, find the value of $\frac{\sqrt[3]{a} - 3b}{4c^7}$.

Ans: (a)(i)_____[1]

(a)(ii)_____[1]

(b)_____[3]

3. (a) (i) Find the value of $\sqrt{3^6 \times 7^4}$, leaving your answer in index notation.

(ii) Find the smallest possible natural number n, such that $3^6 \times 7^4 \times n$ is a perfect cube.

(b) Find a pair of possible value of the natural numbers p and q, such that the HCF of the two distinct numbers $2^p \times 3^7$ and $2^5 \times 3^q$ is $2^5 \times 3^7$.

Ans: (a)(i)_____[1]

(a)(ii)_____[1]

(b) $p =$ _____; $q =$ _____[2]

4. Given that Y is greater than 6, by using the tests of divisibility, find the largest possible six-digit number $834X4Y$ that is divisible by 3 and 4.

Ans: _____[3]

5. (a) Name the correct number law (Commutative Law, Associative Law or Distributive Law) used to achieve Step 2 of the working shown below.

$$\begin{aligned} & 4\times 33\times 25\times 3 \\ &= 33\times 4\times 25\times 3 \\ &= 33\times 100\times 3 \quad \text{(Step 2)} \\ &= 3300\times 3 \\ &= 9900 \end{aligned}$$

(b) Evaluate the following using number laws (Commutative Law, Associative Law or Distributive Law). There is no need to state which law is being used.

(i) $733\times 42+68\times 733-733\times 10$

(ii) 498×12

(iii) $24\div\frac{4}{3}+0.75\times 11-8\frac{3}{4}\times 3$

Ans: (a) Law used:_____[1]

(b) (i)_____[2]

(b) (ii)_____[2]

(b)(iii)_____[2]

6. Evaluate the following:

(a) $1\frac{3}{42} \times [12 - (-2) + 10 + (-3)]$

(b) $(-3) \times 9 + (-0.1)^2 + 8\left(-\frac{3}{2}\right)^3$

(c) $\dfrac{-\frac{3}{5} + \frac{2}{3} \times 4}{-\frac{1}{2} - \frac{1}{3}}$

Ans: (a) _____ [2]

(b) _____ [4]

(c) _____ [3]

7. (a) (i) Estimate the value of $\frac{13665}{0.3511 \times 1.993}$, giving your answer to one significant figure.

(ii) Use your result in (i) to estimate the value of $\frac{13665}{35.11 \times 19.93}$.

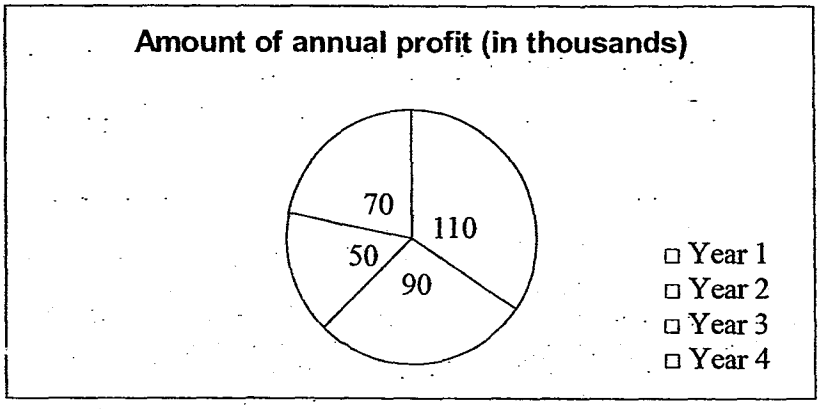
(b) Given that $\sqrt[3]{144} \approx 5.24$ and $\sqrt[3]{1440} \approx 11.29$. Using as much of the given information as possible, evaluate $\sqrt[3]{1.44}$.

Ans: (a)(i)_____[2]

(a)(ii)_____[2]

(b) _____[2]

8. The pie chart below is used to represent the 4 years' annual profit (in thousands) made by a company from 2010 to 2013.



(a) Using appropriate statistical terminology, suggest 2 reasons why the data is not clearly represented by the above pie chart.

Ans:1) _____

_____ [1]

2) _____

_____ [1]

(b) Would a pie chart or line graph be more appropriate to represent these 4 years' annual profit? Give a reason to justify your choice.

Ans: _____

_____ [2]

END OF PAPER

Nanyang Girls' High School
Mathematics Department

MID-YEAR EXAMINATION 2014

SEC 1 MATHEMATICS PAPER 1

Solution

Qn.	Solution
1	In the following order: $-0.\dot{7}5, -\frac{3}{4}, \frac{5}{9}, 0.\dot{5}6$
2(a)(i)	-8
2(a)(ii)	3
2(b)	$\frac{\sqrt[3]{a}-3b}{4c^7}$ $=\frac{\sqrt[3]{-8}-3(2)}{4(-1)^7}$ $=\frac{-2-6}{-4}$ $=2$
3(a)(i)	$3^3 \times 7^2$
3(a)(ii)	$7^2 = 49$
3(b)	Possible pairs: (i) $p=5, q>7$ (ii) $p>5, q=7$ (iii) $p>5, q>7$
4	Possible Y = 8 8+3+4+X+4+Y = 19+X+Y Y | 19+X+Y | largest X 8 | 27+X | 9 Largest number = 834948
5(a)	Associative
5(b)(i)	$733\times 42 + 68\times 733 - 733\times 10$ $= 733\times(42+68-10)$ $= 733\times 100$ $= 73300$
5(b)(ii)	498×12 $=(500-2)\times 12$ $=500\times 12 - 2\times 12$ $=6000-24$ $=5976$
5(b)(iii)	$24\div\frac{4}{3}+0.75\times 11-8\frac{3}{4}\times 3$ $=\frac{3}{4}\times(24+11)-8\frac{3}{4}\times 3$ $=\frac{3}{4}\times 35-\frac{35}{4}\times 3$ $=0$
6(a)	$1\frac{3}{42}\times[12-(-2)+10+(-3)]$ $=1\frac{3}{42}\times[12+2+10-3]$ $=\frac{45}{42}\times 21$ $=\frac{45}{2}$ or 22.5 or $22\frac{1}{2}$
6(b)	$(-3)\times 9+(-0.1)^2+8\left(-\frac{3}{2}\right)^3$ $=-27+(-0.1)^2+8\left(-\frac{3}{2}\right)^3$ $=-27+0.01+8\left(-\frac{27}{8}\right)$ $=-26.99-27$ $=-53.99$

6(c)	$\dfrac{-\frac{3}{5}+\frac{2}{3}\times 4}{-\frac{1}{2}-\frac{1}{3}}$ $=\dfrac{\frac{31}{15}}{-\frac{5}{6}}$ $=\dfrac{31}{15}\times\left(-\dfrac{6}{5}\right)$ $=-\dfrac{62}{25}$ $=-2\dfrac{12}{25}$
7(a)(i)	$\dfrac{13665}{0.3511\times 1.993}$ $\approx\dfrac{14000}{0.35\times 2.0}$ $=\dfrac{14000}{0.7}$ $=20000$
7(a)(ii)	$\dfrac{13665}{35.11\times 19.93}$ $=\dfrac{13665}{0.3511\times 1.993}\times\dfrac{1}{1000}$ $\approx 20000\times\dfrac{1}{1000}$ $=20$
7(b)	$\sqrt[3]{1.44}$ $=\sqrt[3]{\dfrac{1440}{1000}}$ $\approx\dfrac{11.29}{10}$ $=1.129$
8(a)	1) It is unclear what category is represented by which year in the legend. 2) It is unclear which category is represented by which sector. 3) Profit of each year should be expressed in percentage or angle

8(b)	Line graph. It is more suitable to show the trends over a period of time.