Candidate Name _____ Class | Reg Number

TANJONG KATONG SECONDARY SCHOOL
MID-YEAR EXAMINATION 2012
SECONDARY ONE

MATHEMATICS
PAPER 1

Wednesday **9 May 2012** **1 hour 15 minutes**
07 50 – 09 05

Candidates answer on the Question Paper

READ THESE INSTRUCTIONS FIRST

Write your name, class and register number on all the work you hand in.
Write in dark 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.

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 the marks for this paper is 50.

You are reminded of the need for clear presentation of your answers.

Marks
50

This question paper consists of 9 printed pages.

[Turn over

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1 From the list of numbers below,

$$1+2\sqrt{2},\quad \frac{123}{999},\quad 1,\quad 0.1\dot{2},\quad 0,\quad 9,\quad \frac{1}{4},\quad -4.5,\quad \pi$$

Write down
(a) the whole number(s),
(b) the perfect square(s),
(c) the recurring decimal(s),
(d) the irrational number(s).

Answer *(a)* _____ [1]

(b) _____ [1]

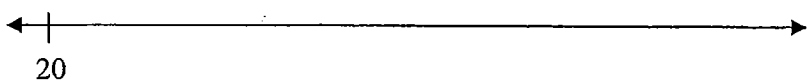
(c) _____ [1]

(d) _____ [1]

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2 Complete the number line below to represent all prime numbers ≥ 20 and ≤ 30.

Answer



[2]

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3 Arrange the given numbers in descending order.

$$-3\frac{7}{11}, \quad -3.6\dot{3}, \quad -3.63, \quad -3.\dot{6}$$

Answer _____ [1]

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4 Express 0.000672 in standard form,

Answer _____ [1]

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5 **(a)** Express 0.061549 correct to 5 decimal places.
(b) Express 0.061549 correct to 3 significant figures.

Answer (a) _____ [1]

(b) _____ [1]

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6 **(a)** Express 920 and 180 as a product of its prime factors in index notation.
(b) Find the highest common factor (HCF) and lowest common multiple (LCM) of 920 and 180.

Answer (a) 920 = _____ [1]

180 = _____ [1]

(b) HCF = _____ [1]

LCM = _____ [1]

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7 It is given that the temperature at the top of a mountain is $-7^{\circ}C$ and the temperature at the foot of the mountain is $15^{\circ}C$.

(a) Find the difference in temperatures between the top and foot of the mountain.

(b) If the mountain has a height of 22 000 m and the rate of change in temperature is constant, find how far he is from the top of the mountain if the temperature is $0^{\circ}C$.

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Answer (a) _____ °C [1]

(b) _____ m[2]

8 Write and simplify an algebraic expression for each of the following statements.

(a) Add $3y$ to twice of $4x-5y$,

(b) Subtract $3x^2-5xy+6$ from $-x^2+11xy+7$.

Answer (a) _____ [2]

(b) _____ [2]

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9 Simplify each of the following expressions.

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

(b) $4m+(-2m)^2 \div (-m) \times 5$

(c) $\frac{3p+q}{4} - \frac{p-q}{3}$

(d) $\frac{1}{2}(4x-2y) - \frac{2}{3}(9x-3y)$

Answer (a) _____ [2]

(b) _____ [3]

(c) _____ [3]

(d) _____ [3]

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10 Given that p is an integer,

(a) Write down the sum of three odd consecutive numbers larger than $2p$.

Answer (a) _____ [2]

(b) Explain why the sum is a multiple of 3.

Answer (b) _____

_____

[1]

11 Given that $x = 5$, $y = -5$, $z = -2$, $h = 0$ and $k = -1$, evaluate each of the following.

(a) $xy(2x - 4k + xhz)$,

(b) k^{x-z}.

Answer (a) _____ [1]

(b) _____ [2]

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12 Factorise the following expressions completely.

(a) $3x^3y^5 + \frac{1}{3}x^3y^2$,

(b) $m(2p-q) - 5n(q-2p)$,

(c) $xy - x + y - 1$.

Answer (a) _____[2]

(b) _____[2]

(c) _____[2]

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13 Solve the equation $2x-[3+3(x-8)]=6$.

Answer _____ [3]

14 When a number is halved and 5 is subtracted from the result, the answer is 33.

(a) Let the number be $k+1$. Form an equation using the given information above.

(b) Hence, find the value k.

Answer (a) _____ [1]

(b) _____ [2]

End of Paper

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Secondary School Exam Papers

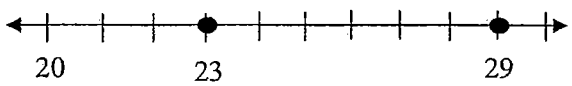
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Numeric answer

1a) 0, 1, 9 b) 1, 9 c) $\frac{123}{999}$, $0.1\dot{2}$ d) $1+2\sqrt{2}$, π

2)



3) -3.63, $-3.6\dot{3}$, $-3\frac{7}{11}$, $-3.\dot{6}$

4) 6.72×10^{-4}

5a) 0.06155 b) $0.06\dot{1}5$

6a) $920 = 2^3 \times 5 \times 23$, $180 = 2^2 \times 3^2 \times 5$

6b) HCF = 20, LCM = 8280

7a) 22°C b) 7 000m

8a) $8x - 7y$ b) $-4x^2 + 16xy + 1$

9a) $5a - 6b$ b) $-16m$ c) $\frac{5p+7q}{12}$ d) $-4x + y$

10a) $6p + 9$ b) It is a multiple of 3 because 3 is a factor of the expression.

11a) -350 b) -1

12a) $\frac{1}{3}x^3y^2(9y^3+1)$ b) $(2p-q)(m+5n)$ or $(-m-5n)(q-2p)$ c) $(y-1)(x+1)$

13) $x = 15$

14a) $\frac{k+1}{2} - 5 = 33$ b) $k = 75$

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TANJONG KATONG SECONDARY SCHOOL
MID-YEAR EXAMINATION 2012
SECONDARY ONE

MATHEMATICS

Paper 2

Friday **4 May 2012** **1 hour 15 minutes**
07 50 – 09 05

Candidates answer on the Writing Paper

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The total number of marks for this paper is 50.

This question paper consists of **5** printed pages. **[Turn over**

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Answer **all** the questions.

1 **(a)** Calculate $\dfrac{\left(1\frac{1}{7}\right)^2 - \left(-\frac{1}{3}\right)^2}{-\sqrt{\frac{81}{121}} \div \sqrt[3]{-\frac{64}{343}}}$, giving your answer correct to 3 significant figures. [1]

(b) Round off 289.57 to

(i) the nearest whole number, [1]

(ii) 1 decimal place, [1]

(iii) 2 significant figures, [1]

(iv) the nearest perfect square. [1]

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2 Given that $p = 2$, $q = -3$ and $r = -1$, evaluate

(a) $\dfrac{r}{p+q}$, [1]

(b) $(pq)^3$. [2]

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3 The number of people who turned up for the Singapore Computer Fair 2012 on Saturday is 185 905. The number of people who turned up on Sunday is 2.21×10^5.

(a) Write down the number of people who turned up on Saturday in standard form. [1]

(b) Find the difference in the number of people who turned up on Saturday and Sunday. [2]

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4 **(a)** Find the highest common factor of 90 and 120. [3]

(b) A rectangular sheet of paper has dimension of 1.2 m by 0.9 m. If the paper is cut into identical squares, find the minimum number of identical squares that can be obtained. [2]

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5 When written as the product of their prime factors,

p is $2^3 \times 3^6$,
q is $2 \times 3^2 \times 5$.

(a) Find

(i) the value of the cube root of p. [1]

(ii) the smallest possible value of x such that xq is a perfect square. [1]

(b) Express 84 as the product of its prime factors. [1]

Hence, write down

(i) the LCM of p, q and 84, giving your answer as the product of its prime factors, [1]

(ii) the greatest number that will divide p, q and 84 exactly. [1]

---

6 **(a)** Find the sum of $a+b+c$, $2b-c$, and $3c+a$. [1]

(b) **(i)** Simplify $5x(2x-4y)-3(x-7y)$. [2]

(ii) Subtract your answer in **b(i)** from $21x^2+7y-12xy+5x$. [3]

---

7 **(a)** Simplify the following expressions.

(i) $(3q)^2 \times 2q$ [1]

(ii) $(-2a)^3 \div 4a^2$ [2]

(iii) $-2\times(-3a)-5\times 8a$ [2]

(b) Solve $8+\dfrac{2x-1}{2}=3x$. [2]

[Turn over

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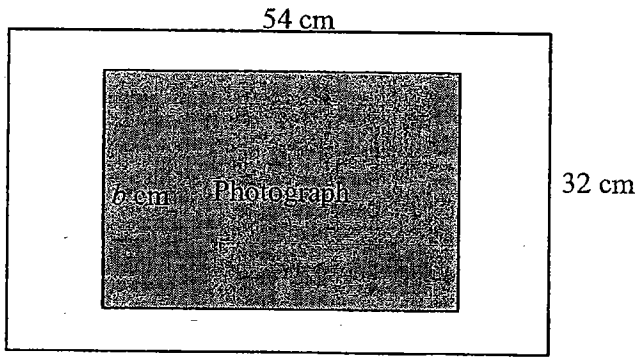
8 Adil and Haziq ran the same distance to determine who runs faster. The time taken by each of them is recorded. The time taken by Adil subtracted from the time taken by Haziq is $2p-8+2pq-8q$.

(a) Factorise completely $2p-8+2pq-8q$. [3]

(b) Given that Adil finished his run earlier than Haziq.
State a possible value of p and of q. [2]

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9 A photo frame has dimension 54 cm by 32 cm as shown below.



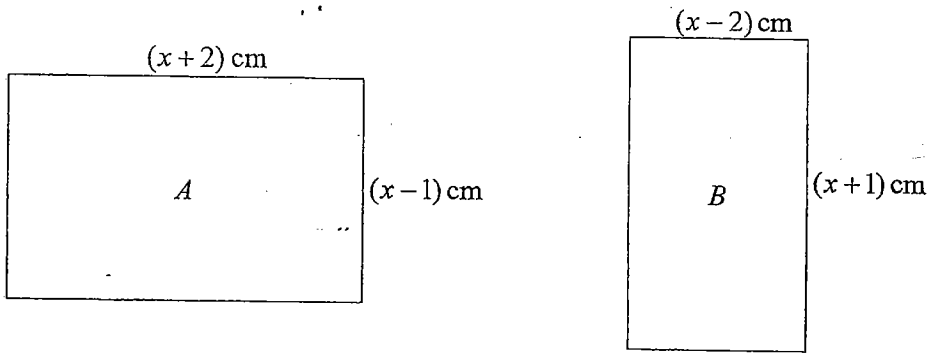
The photograph within the frame has a width of b cm. Its length is one and a half times its width.

(a) Write an expression for the area of the photograph in terms of b. [2]

(b) The area of the photo is half the area of the frame. Find the length and width of the photo. [3]

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10 Two rectangles, A and B are shown below. Rectangle A has dimension $(x+2)$ cm by $(x-1)$ cm. Rectangle B has dimension $(x-2)$ cm by $(x+1)$ cm.



(a) Find and simplify the expressions for the perimeter of

(i) rectangle A, [1]

(ii) rectangle B. [1]

(b) Given that the perimeter of rectangle A is $\frac{13}{11}$ of rectangle B.

(i) Using your answers from **(a)(i)** and **(a)(ii)**, write down an equation to represent this information. [1]

(ii) Solve the equation in **(b)(i)**. [3]

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Answer

1a	0.835	6a	$2a+3b+3c$
1b(i)	290	6b(i)	$10x^2-20xy-3x+21y$
1b(ii)	289.6	6b(ii)	$11x^2-14y+8x+8xy$
1b(iii)	290	7a(i)	$18q^3$
1b(iv)	289	7a(ii)	$-2a$
2a	1	7a(iii)	$-34a$
2b	-216	7b	$x=3\frac{3}{4}$
3a	1.85905×10^5	8a	$2(p-4)(1+q)$
3b	35095	8b	$p>4, q>-1$ or $p<4, q<-1$
4a	30	9a	$1.5b^2$
4b	12	9b	$b=24$ $l=36$
5a(i)	18	10a(i)	$4x+2$
5a(ii)	10	10a(ii)	$4x-2$
5b	$2^2\times3\times7$	10b(i)	$4x+2=\frac{13}{11}(4x-2)$
5b(i)	$2^3\times3^6\times7\times5$	10b(ii)	$x=6$
5b(ii)	6		

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