BUKIT PANJANG GOVT HIGH SCHOOL
MID YEAR EXAMINATION 2007
SECONDARY TWO EXP / NORMAL (ACADEMIC)

MATHEMATICS
Paper 1

Date : Monday, 7th May, 2007 **Time : 1040 - 1140**

INSTRUCTIONS TO CANDIDATES

Write your name, registration number and class in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

If working is needed for any question it must be shown below that question.

Calculators **must not** be used in this paper.

INFORMATION FOR CANDIDATES

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

You should not spend too much time on any one question.

FOR EXAMINER'S USE
50

This question paper consists of 8 printed pages.

[Turn Over

Answer all questions [50%]

1. Evaluate (a) $\frac{2}{5}-\frac{5}{7}+\frac{4}{7}$ (b) $7.59 - 9.254$

Ans: (a) _____ [1]

(b) _____ [1]

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2. A sum of money was shared between Ahmad, Jing and Andy in the ratio 2 : 3 : 7.
If Jing's share was $14.10, calculate
(a) Andy's share, (b) the total sum of money.

Ans: (a) _____ [1]

(b) _____ [1]

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3. (a) Express $56.74\dot{8}$ correct to 3 significant figures.
(b) Express 0.01425 in index notation.

Ans: (a) _____ [1]

(b) _____ [1]

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4. Evaluate (a) $2.8 \times 10^5 + 3.2 \times 10^6$ (b) $\dfrac{10^{-2} \times 10^7}{10^{-5} \div 10^{-3}}$

Ans: (a) _____ [1]

(b) _____ [1]

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5. James earned $1000 per month in 2005. His pay was increased by 20% in 2006. In 2007, his pay was reduced by 20%. Calculate his pay in 2007.

Ans: _____ [3]

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6. A map of a region is drawn to a scale of 1 : 25 000.
   (a) Calculate the actual distance, in km, represented by 30 cm on the map;
   (b) On the map, a lake has an area of 24 cm^2. Calculate, in km^2, the actual area of the lake.

Ans: (a) _____ [2]

(b) _____ [2]

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7. A polygon has n sides. Three of its exterior angles are 72°, 54° and 34°, while the remaining (n 3) exterior angles are each equal to 40°. Find n.

Ans: _____ [2]

8. Showing your working clearly, use algebraic results to evaluate
   (a) 602×598
   (b) 1187^2 187^2

Ans: (a) _____ [2]

(b) _____ [2]

9. Factorise completely
   (a) m^4 121
   (b) $1 + 4n$ $21n^2$

Ans: (a) _____ [2]

(b) _____ [2]

10. Express each of the following as a fraction with a single denominator.

(a) $\frac{x-1}{5} - \frac{2x+3}{6}$

(b) $\dfrac{\frac{1}{x} - \frac{1}{y}}{\frac{1}{x} + \frac{1}{y}}$

Ans: (a) _____ [2]

(b) _____ [2]

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11. Two positive numbers differ by 6 and the square of their sum is 256. Find the two numbers.

Ans: _____ [3]

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12. Solve the equations (a) $\frac{m}{3m-2} = \frac{3}{7}$

(b) $2n^2 - 9n = 18$

Ans: (a) _____ [2]

(b) _____ [2]

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13. John has a sum of money. If he spends $12 a day, it would last him 3 more days longer than if he spends $16 a day. Find the sum of money he has.

Ans: _____ [4]

14. Solve the following simultaneous equations:

$$\frac{x + 2y}{5} = 3$$

$$\frac{x}{2} - \frac{3y}{5} = 4$$

Ans: _____ [3]

15. Make h the subject of the formula $2k \quad h = \frac{3hk}{4}$.

Ans: _____ [2]

16. At a concert, tickets for adults are sold at $30 each and student tickets are at at $12.50 each. If 350 tickets are sold and $8225 is collected, find the number of each kind of ticket being sold.

Ans: No. of adult tickets = _____[2]

No. of student tickets = _____[2]

End of Paper One

Answers

1. (a) $\frac{9}{35}$ (b) 1.664

2. (a) \$32.90 (b) \$56.40

3. (a) 56.7 (b) 1.425×10^{-2}

4. (a) 3.48×10^{6} (b) 10^{7}

5. (a) \$960

6. (a) 7.5 km (b) 1.5 km^2

7. $n = 8$

8. (a) 359996 (b) 1 374 000

9. (a) $(m^2 + 11)(m^2 - 11)$ (b) $(1 - 3n)(1 + 7n)$

10. (a) $\frac{-4x-21}{30}$ (b) $\frac{y-x}{y+x}$

11. 5, 11

12. (a) 3 (b) $n = 6$ or $-\frac{3}{2}$

13. \$144

14. $x = \frac{85}{8}$, $y = \frac{35}{16}$

15. $\frac{8k}{4+3k}$

16. *Adult* = 220, student = 130

NAME:_____ INDEX NUMBER:_____ CLASS:_____

50

BUKIT PANJANG GOVERNMENT HIGH SCHOOL

SECONDARY TWO EXPRESS
MID-YEAR EXAMINATION, 2007
MATHEMATICS
PAPER 2

Date : Wednesday, 09th May 2007 **Time: 1 hour 15 min**
Time : 1040 – 1155

INSTRUCTIONS TO CANDIDATES

Write your name, class and register number at the top of this page.

Answer **ALL** the questions in this paper.

Write the answers and show all the workings, diagrams on the answer sheets.

Omission of essential working will result in the loss of marks.

INFORMATION FOR CANDIDATES

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

The total marks for this paper is 50.

You are expected to use an approved electronic calculator to evaluate explicit numerical expression.

If the degree of accuracy is not specified in the question, and if the answer is not exact, give your answer correct to 3 significant figures. Give answers in degrees to one decimal place.

THIS QUESTION PAPER CONSISTS OF **8** PRINTED PAGES.

Answer ALL the questions in the spaces provided. [50m]

1(a) Use your calculator to evaluate the following, giving your answer to 2 decimal places.

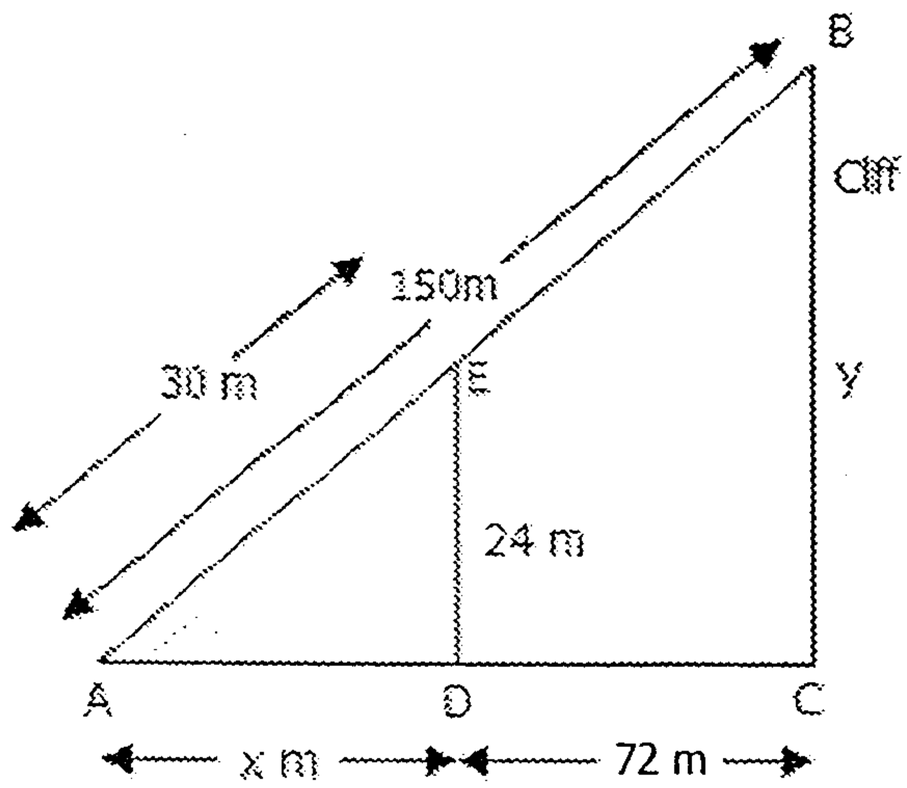
$$\frac{\left(1\frac{1}{7}\right)^2 - \left(-\frac{1}{3}\right)^2}{-\sqrt{\frac{81}{121}} \div \sqrt[3]{\frac{-64}{343}}}$$

Answer : _____ [2]

(b) Divide $(4x^2 - 6x + 5)$ by $(x + 3)$

Answer : _____ [3]

2



A stick 24 m long is placed vertically so that its top is in line with the top of a vertical cliff, from a point A on the ground x m from the stick and 72 m from the cliff, as shown in the diagram.

Calculate

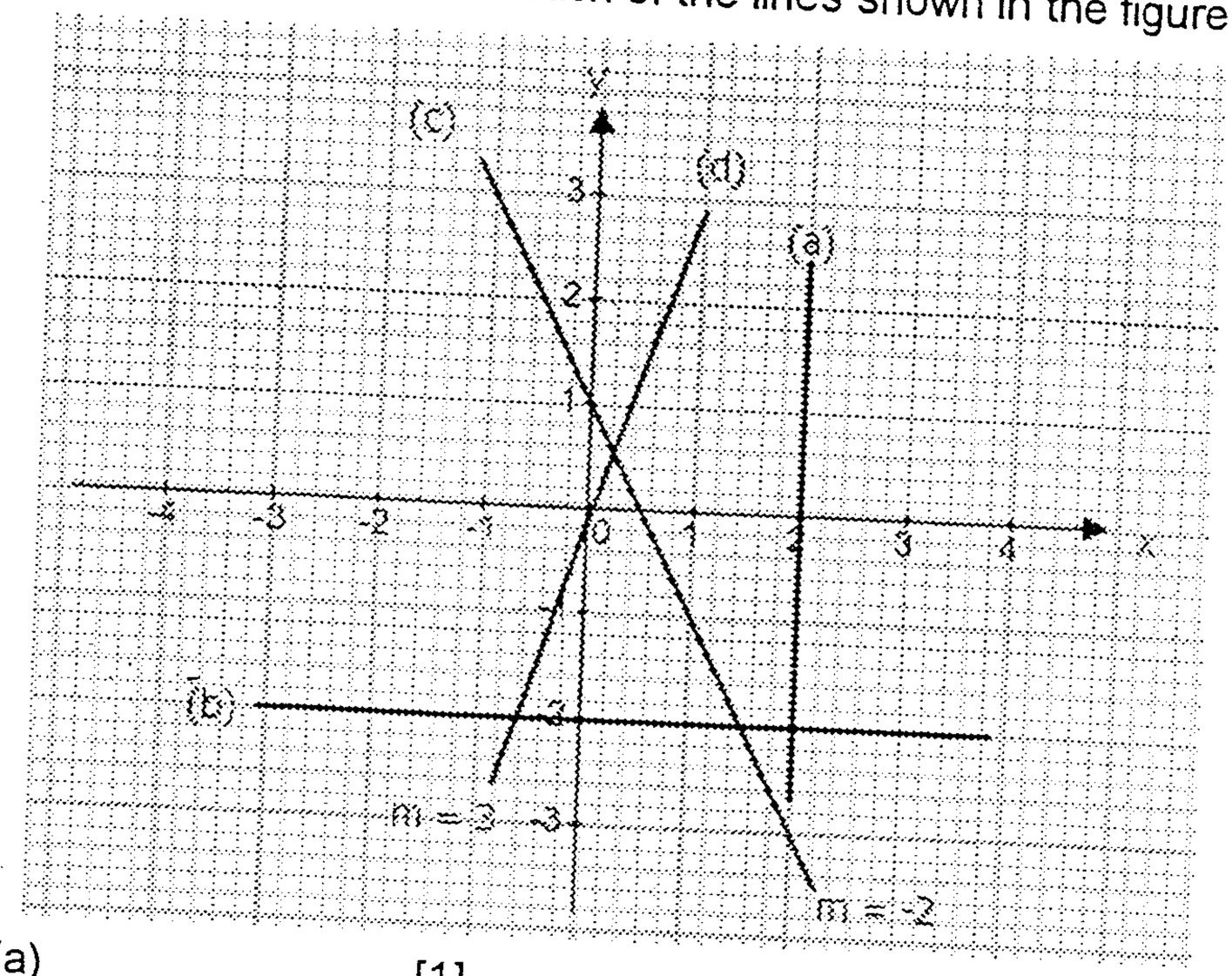
(a) the value of x,

Answer : _____ [2]

(b) the value of y, the height of the cliff.

Answer : _____ [2]

3 Write down the equation of each of the lines shown in the figure below.



Answer : (a) _____ [1]

(b) _____ [1]

(c) _____ [1]

(d) _____ [1]

4 Factorise completely

(a) $ac - 2bc + 3ad - 6bd$

Answer : _____ [2]

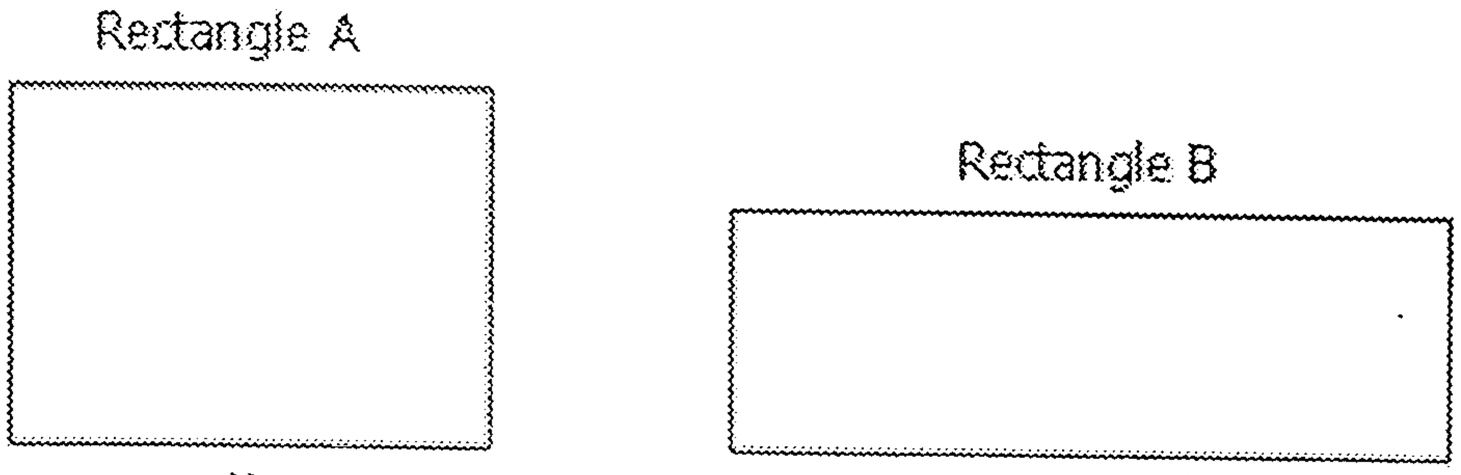
(b) $4x^2 + 12xy + 9y^2 - 16$

Answer : _____ [2]

(c) $9pm^2 - 6pn - 6qm^2 + 4qn$

Answer : _____ [2]

5 Rectangle A and rectangle B each has an area of 12 cm^2. The length of rectangle A is x cm. The length of rectangle B is (x + 3) cm.



(a) Find, in terms of x, an expression for the width of

(i) rectangle A.

Answer : _____ [1]

(ii) rectangle B.

Answer : _____ [1]

(b) Given that the width of rectangle A is 2 cm greater than the width of rectangle B, form an equation in x and show that it simplifies to $x^2 + 3x - 18 = 0$.

[1]

(c) Solve the equation $x^2 + 3x - 18 = 0$.

Answer : _____ [2]

(d) Hence, find the perimeter of rectangle B.

Answer : _____ [1]

6(a) Simplify the following fraction.

$$\frac{4x^2+6x}{x^2-1} \div \frac{2x^2+3x}{x^2+3x+2}$$

Answer : _____ [3]

(b) Subtract $3x^3 + 3x^2 - 2x$ from $(2x + 3)(x - 6)$

Answer : _____ [2]

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7 Solve the equations:

(a) $6+\frac{2x+1}{3}=x$

Answer : _____ [2]

(b) $\frac{3}{t}=\frac{5}{t-7}$

Answer : _____ [2]

8 Solve the following simultaneous equations:

$$5x - 6y = 27$$
$$3x - 2y = 13$$

Answer : _____ [3]

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9 If $A = \frac{\pi d}{4}(d + h)$,

(a) make h the subject of the formula.

Answer : _____ [2]

(b) Hence, find the value of h when $A = 82\frac{1}{2}$, $\pi = \frac{22}{7}$ and $d = 5$.

Answer : _____ [2]

10 The table below are some x- and y-values for the curve $y = 2x^2 - 15x + 50$.

x	0	1	2	3	4	5	6
y	50	*p*	28	*q*	22	*r*	32

(a) Find the values of *p*, *q* and *r*.

Answer : _____ [2]

(b) Using a scale of 2 cm to represent 1 unit on the x-axis and 2 cm to 10 units on the y-axis, plot the graph of $y = 2x^2 - 15x + 50$ for $0 \leq x \leq 6$ on the graph paper provided. [3]

(c) Use the graph to find the least value of y and the corresponding value of x.

Answer : _____ [2]

From your graph, find

(d) the values of x when y = 30.

Answer : _____ [1]

(e) the values of y when x = 2.5.

Answer : _____ [1]

***** End of Paper *****

Answers to Mid-year Examinations 2007 Paper 2

1(a) 0.72 (b) $4x - 18 + \frac{59}{(x+3)}$

2(a) x = 22.5 (b) y = 120

3(a) x = 2 (b) y = -2 (c) y = -2x + 1
(d) y = 3x

4(a) (a - 2b)(c + 3d) (b) (2x + 3y - 4)(2x + 3y +4)
(c) $(3p - 2q)(3m^2 - 2n)$

5(a)(i) $\frac{12}{x}$ (ii) $\frac{12}{(x+3)}$ (c) x = 3 or -6
(d) 16 cm

6(a) $\frac{x-2}{x-1}$ (b) $-3x^3 - x^2 - 7x - 18$

7(a) x = 19 (b) $t = -10\frac{1}{2}$

8 x = 3, y = -2

9(a) $h = \frac{4a}{\pi d} - d$ (b) h = 16

10(a) p = 37, q = 23, r = 25 (c) x = 3.75, y = 21.5
(d) x = 1.75 or 5.75 (e) y = 25

10(b)