

Answer ALL questions [40 marks]

1. A daily-rated worker is paid \$19.65 for an 8-hour day.

Calculate (a) the amount she earns in two weeks if she works 6 days a week,

(b) the amount she is paid per hour.

Ans : (a) \$ _____ [2]

(b) \$ _____ [2]

2. Find the representative fraction of a map in the form 1 : n, if 16 cm^2 on the map represents 0.64 km^2 on the ground.

Ans : _____ [2]

3. Given that m is directly proportional to n^3 and that $m = 450$ when $n = 5$,

(a) express m in terms of n ,

(b) find the value of m when $n = -3$

Ans : (a) _____ [3]

(b) _____ [2]

4. Given that eight numbers 13, p , 15, 9, q , 11, r and s have a mean of 17,

find the mean of p , q , r and s .

Ans : _____ [3]

5. The distribution of the heights (x cm) of 80 girls is given in the table below:

x (in cm)	152	153	154	155	156	157	158
No. of girls	6	10	20	22	14	6	2

Find (a) the mode,

(b) the median,

(c) the mean of the distribution , giving your answer correct to 1 decimal place.

Ans : (a) _____ girls [1]

(b) _____ girls [1]

(c) _____ girls [2]

6. Expand and simplify the following:

(a) $(2x^2 + 5y)(2x^2 - 5y)$

(b) $-11(3.7x - 5y) + 7x - 1.3y$

Ans : (a) _____ [1]

(b) _____ [1]

7. Each of the letters of the school name, 'ST THERESA'S CONVENT' is written on a card.

All the seventeen cards are well-shuffled and placed down on a table.

If a card is turned over, what is the probability that the card bears,

- (a) the letter ' S ',
- (b) a vowel,
- (c) the letter ' P ' ?

Ans : (a) _____ [1]

(b) _____ [1]

(c) _____ [1]

8. Factorise the following completely:

(a) $(1 + r)^2 - 169$

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

(c) $4y^2 - 8y - 21$

Ans : (a) _____ [2]

(b) _____ [2]

(c) _____ [2]

6

9. Solve the following equations:

(a) If $x^2 + y^2 = 57$ and $xy = 3$, find the value of $3(x+y)^2$.

(b) Solve $\frac{5}{x+2} - \frac{3}{x+3} = 0$

Ans : (a) _____ [2]

(b) _____ [2]

10. Express as a single fraction with a single denominator.

$$\frac{\frac{1}{2}m + 3}{n - \frac{1}{5}}$$

Ans : _____ [3]

7

11. Given that $u = \frac{v^2 + 4}{5}$,

(a) find the value of u when $v = 3$,

(b) express v in terms of u .

Ans : (a) _____ [2]

(b) _____ [2]

----- End of Paper -----
Have you checked your work?

Answer ALL questions.

- 1 (a) Evaluate $\frac{1.2^2 + \sqrt{9.4^3}}{\sqrt[4]{4.1 \times 10^3}}$, giving your answer correct to 3 significant figures. [2]
- (b) Zoe borrowed \$6 150 for 50 days at 10% per annum simple interest. Taking 1 year to be 365 days, find the amount she has to pay at the end of 50 days. Give your answer to the nearest cent. [3]
- (c) A family of three uses 45 litres of water a day. On Saturdays this amount is increased by 20%, but on Sundays it is decreased by 5%. In how many weeks will the family use 1287 litres of water? [3]
- 2 During her March holidays, Angela changed S\$1440 into U.S. dollars, when the exchange rate was S\$x = US\$1.
- (a) Write down an expression, in terms of x , for the number of U.S. dollars she received. [1]
- (b) In June, she found that she had another S\$1440. She changed this amount into U.S. dollars again. The exchange rate is now S\$($x + 0.1$) = US\$1. Write down an expression, in terms of x , for the number of U.S. dollars she received this time. [1]
- (c) Given that she received US\$60 less in June than in March, form an equation in x and show that it reduces to $10x^2 + x - 24 = 0$. [3]
- (d) Solve this equation and find the exchange rate in June. [3]
- 3 (a) Factorise completely $a^3 - 4a - 3a^2 + 12$. [3]
- (b) Simplify $\frac{x^2 - 81}{9 - x}$. [2]
- (c) Simplify $\frac{4x^2 + 14x - 30}{4x^2 - 9}$ and express it in its simplest form. [3]
- (d) Simplify $\frac{3x}{4y} \div \left(\frac{5x}{12y^2} \div \frac{10xy}{3y} \right)$. [3]
- (e) Solve the equation $\frac{1}{v} - \frac{1}{v+6} = \frac{2}{45}$ [3]

- 4 (a) (i) Factorise completely $a^2 - b^2$. [1]
- (ii) Use the result obtained in (a)(i) to find the value of x if $10x = 301^2 - 299^2$. [2]
- (b) (i) Expand and simplify $(x - y)^2 - x(x - 2y)$. [2]
- (ii) Use the result obtained in (b)(i) to find the value of $22395^2 - 22400 \times 22390$. [2]

- 5 Find three consecutive odd numbers such that $\frac{1}{5}$ of the first number add $\frac{1}{11}$ of the second number add the third number is 101. [3]

- 6 Given that $\frac{1}{a} = \frac{1}{x} + \frac{1}{y}$,
- (a) find the value of a when $x = -3$ and $y = 4$, [2]
- (b) make x the subject of the formula. [2]

- 7 In a primary 6 class, the PSLE aggregate score achieved by 41 students were distributed as follows:

PSLE Aggregate	$180 < x \leq 190$	$190 < x \leq 200$	$200 < x \leq 210$	$210 < x \leq 220$	$220 < x \leq 230$
No. of students	3	x	15	10	2

- (a) Write down the value of x . [1]
- (b) Write down the modal class. [1]
- (c) Calculate the mean PSLE aggregate score. [3]
- (d) If a student is selected at random, find the probability that the student's score is greater than 210. [1]

End of Paper 2

Answer Key

1a) \$1886.4

b) \$2.46

2) 1: 20, 000

3) $m = 3.6n^3$

$m = -97.2$

4) 88

5a) 155

b) 155

c) 154.7

6a) $4x^4 - 25y^2$

b) $-33.7x + 53.7y$

7a) $1/17$

b) $5/17$

c) 0

8a) $(r-2)(r+14)$

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

c) $(2y-7)(2y+3)$

9a) 189

b) -4.5

10.

$(5m+30)/(10n-2)$

11a)

b)



Answer Key**2007 Mid-Year Sec 2 Exp Mathematics Paper 2**

- 1(a) 3.78
 1(b) \$6234.25
 1(c) 4 weeks

2(a) $\frac{US\$1440}{x}$

2(b) $\frac{US\$1440}{x+1}$

2(d) S\$1.60 = US\$1

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

3(b) $-x-9$

3(c) $\frac{2(x+5)}{2x+3}$

3(d) $6xy$

3(e) $v = 9$ or -15

4(ai) $(a+b)(a-b)$

4(aii) $x = 120$

4(bi) y^2

4(bii) 25

5 $75, 77, 79$

6(a) $a = -12$

6(b) $x = \frac{ay}{y-a}$

7(a) $x = 11$

7(b) $200 < x \leq 210$

7(c) 204

7(d) $\frac{12}{41}$

