J.M.J.CH

MARCELLIN COLLEGE RANDWICK

YEAR 8

Task 1

MATHEMATICS

2014

Weighting: 15% of Assessment Mark.

STUDENT NAME: _____

MARK: / 55

TIME ALLOWED: 45 minutes.

Section 1: Number and Multiple Choice /10

Section 2: Percentages /15

Section 3: Algebra /30

DIRECTIONS:

- Answer all questions.
- Show all necessary working where more than one mark is allocated to a question.
- Full marks will not be awarded for answers only.
- Marks may not be awarded for careless or badly arranged work.
- Calculators are allowed and **SHOULD BE USED**

Section 1- Number

(10 marks)

Question 1: Answer the following using your calculators. 1 mark each

a. $\frac{-5-10}{8+4} =$	b. Write in descending order: 5.5%, 0.05, 1.5
c. $7^4 - \sqrt[3]{1000} + 10 =$	d. Complete the following: $\frac{3}{4} = \frac{\square}{300}$
e. $\{(4-16) \div (-6 \times 2)\} + 9 =$	f. List all prime numbers between 30 and 50.

Question 2: Circle the correct response 1 mark each

a. When 1.3563 is rounded to 2 decimal places the result is

A. 1 B. 1.35 C. 1.36 D. 2.0

b. When $6(m-1)$ is expanded the result is:

A. $6m-6$ B. $6m-1$ C. $m-6$ D. $6m-36$

c. When $-10m--4m$ is simplified the result is:

A. $-14m$ B. $-6m^2$ C. $-6m$ D. m^6

d. The quotient of 216 and 8 is:

A. 0 B. 224 C. 27 D. 1728

Section 2- Percentages

(15marks)

Question 1: 1 mark each

a. Write 2.13 as a percent.	c. Convert 55% to a fraction in its simplest form.
b. Write 14.5% as a decimal	d. Convert $\frac{7}{9}$ to a percentage, correct to 1 dec.pl.

Question 2: 1 mark each

a. Find $19\frac{1}{4}$% of $230	c. Decrease 70kg by 52%
b. Increase 625g by 34%	d. Jack scored 36 out of 55. What is his mark as a percentage?

Question 3

2 marks

Michael paid $55 000 for a car he later sold it to Jane for 80% of what he paid. Afterwards Jane sold it to her friend for 75% of what she paid Michael. What was Jane's selling price?

Question 4

2 marks

A car salesman gains a commission of 8% of the price of every car he sells. What commission will he receive if he sells two cars for $45000 each?

Question 5

1 mark

Express 800 metres as a percentage of a kilometre.

Question 6

2 marks

Jack purchased a painting for $3420, he later sold it and made a profit of $1230. Calculate his profit as a percentage of the selling price.

Section 3- Algebra

(29 marks)

Question 1: Simplify the following

1 mark each

a. $4m + 15m - 3$	c. $-9k^2 + k - k^2 + 12k$	e. $0.25 \times 1.2y$
b. $-ny - ny + n^2$	d. $-2mp \times (-4mn)$	f. $8m \div 2$

Question 2: Simplify completely (Show all working)

2 marks each

a. $\frac{4 \times 8m}{10m}$

b. $6 \times 4n^2 \div 12n$

c. $\frac{(2ab)^2}{ab}$

Question 3 (show all working)

2 mark each

If $n = -2$ and $m = 5$, calculate:

a. nm

c. $\frac{n^2+1}{m}$

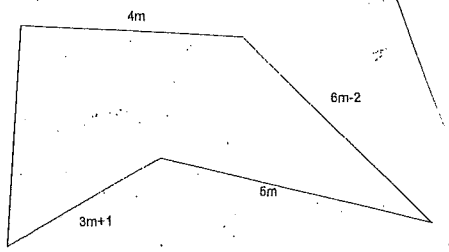
b. $2n - 6m$

d. $\sqrt{m - n + 2}$

Question 4

3 marks

a. Write an expression for the perimeter of the shape below



b. If the perimeter is equal to 47cm, find the value of m

Question 5

1 mark each

a. Write $4y^3m^5$ in expanded form:	b. Simplify $3 \times y \times m \times m \times -4$ using index notation:

Question 6

5 marks

Expand and simplify:

a. $2(m - 4)$

b. $-3(m - 5) + 9$

c. $3(m - 2) + 4(m - 2)$

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SOLUTIONS

Section 1- Number

(10 marks)

Question 1: Answer the following using your calculators. 1 mark each

a. $\frac{-5-10}{8+4} = -1.25$ ✓	b. Write in descending order: 5.5%, 0.05, 1.5 — 1.5, 5.5%, 0.05 ✓
c. $7^4 - \sqrt[3]{1000} + 10 = 2401$ ✓	d. Complete the following: $\frac{3}{4} = \frac{225}{300}$ ✓
e. $\{(4-16) \div (-6 \times 2)\} + 9 = 10$ ✓	f. List all prime numbers between 30 and 50. 31, 37, 41, 43, 47 ✓

Question 2: Circle the correct response 1 mark each

a. When 1.3563 is rounded to 2 decimal places the result is

A. 1 B. 1.35 **C. 1.36** D. 2.0 ✓

b. When $6(m-1)$ is expanded the result is:

A. $6m-6$ B. $6m-1$ C. $m-6$ D. $6m-36$ ✓

c. When $-10m--4m$ is simplified the result is:

A. $-14m$ B. $-6m^2$ **C. $-6m$** D. m^6 ✓

d. The quotient of 216 and 8 is:

A. 0 B. 224 **C. 27** D. 1728 ✓

Section 2- Percentages

(15marks)

Question 1: 1 mark each

a. Write 2.13 as a percent. 213% ✓	c. Convert 55% to a fraction in its simplest form. $\frac{11}{20}$ ✓
b. Write 14.5% as a decimal 0.145 ✓	d. Convert $\frac{7}{9}$ to a percentage, correct to 1 dec.pl. 77.7% ✓

Question 2: 1 mark each

a. Find $19\frac{1}{4}$% of \$230 \$44.27 ✓	c. Decrease 70kg by 52% 33.6 kg ✓
b. Increase 625g by 34% = 837.5g ✓	d. Jack scored 36 out of 55. What is his mark as a percentage?

Question 3

2 marks

Michael paid \$55 000 for a car he later sold it to Jane for 80% of what he paid. Afterwards Jane sold it to her friend for 75% of what she paid Michael. What was Jane's selling price?

1. $0.8 \times 55000 = 44000$
2. $0.75 \times 44000 = 33000$ //

A = \$33000

Question 4 — 2 marks

A car salesman gains a commission of 8% of the price of every car he sells. What commission will he receive if he sells two cars for $45000 each?

1.08 × 45000 = $3600
2 3600 × 2 = $7200
A = $7200

Question 5 — 1 mark

Express 800 metres as a percentage of a kilometre.

80%

Question 6 — 2 marks

Jack purchased a painting for $3420, he later sold it and made a profit of $1230. Calculate his profit as a percentage of the selling price.

1 Profit = $1230 Selling price = $4650

∴ %tage profit of S.P = $\frac{1230}{4650} \times 100\%$

$= 26\frac{14}{31}\%$

Section 3- Algebra (29 marks)

Question 1: Simplify the following — 1 mark each

a. $4m + 15m - 3$ $19m - 3$ ✓	c. $-9k^2 + k - k^2 + 12k$ $-10k^2 + 13k$ ✓	e. $0.25 \times 1.2y$ $0.3y$ ✓
b. $-ny + ny + n^2$ $-2ny + n^2$ ✓	d. $-2mp \times (-4mn)$ $8m^2pn$ ✓	f. $8m \div 2$ $4m$ ✓

Question 2: Simplify completely (Show all working) — 2 marks each

a. $\frac{4 \times 8m}{10m}$

1. $4 \times 8m = 32m$
2. $32m \div 10m = 3.2m$

$\frac{2 \cancel{4} \times \cancel{8m}}{\cancel{10m}_{5}}$ $\frac{16}{5} = 3\frac{1}{5}$ $A = \cancel{3.2m}$ ✗ ✓

b. $6 \times 4n^2 \div 12n$

1. $6 \times 4n^2 = 24n^2$
2. $\frac{24n^2}{12n} = 2n$

$A = 2n$ ✓

c. $\frac{(2ab)^2}{ab}$

1. $(2ab)^2 = 2ab \times 2ab = 4a^2b^2$
2. $\frac{4a^2b^2}{ab} = 4ab$

$A = 4ab$ ✓

Question 3 (show all working) — 2 mark each

If $n = -2$ and $m = 5$, calculate:

a. nm

1. $nm = -2 \times 5 = -10$

$A = -10$ ✓

b. $2n - 6m$

1. $2 \times -2 = -4$
2. $6 \times 5 = 30$
3. $-4 - 30 = -34$

$A = -34$ ✓

c. $\frac{n^2+1}{m}$

1. $(-2)^2 = 4$
2. $\frac{4+1}{m} = \frac{5}{m}$

$\frac{4+1}{5} = 1$ ✗ $A = 5m$ ✓

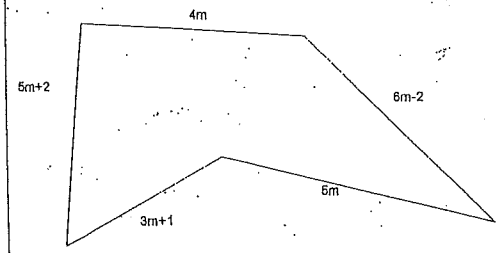
d. $\sqrt{m - n + 2}$

1. $= \sqrt{5 - -2 + 2}$
2. $= 9$
3. $\sqrt{9} = 3$

$A = 3$ ✓

Question 4 — 3 marks

a. Write an expression for the perimeter of the shape below



(a) Perimeter
$= 4m + 6m - 2 + 5m + 3m + 1 + 5m + 2$
$= 23m + 4$

b. If the perimeter is equal to 47cm, find the value of m

(b) $23m + 4 = 47$
$\therefore 23m = 43$
$m = \frac{43}{23}$
$= 1\frac{20}{23}$

Question 5 — 1 mark each

a. Write $4y^3m^5$ in expanded form:

$4 \times y \times y \times y \times m \times m \times m \times m \times m$ ✓

b. Simplify $3 \times y \times m \times m \times -4$ using index notation:

$-12m^2y$

Question 6 — 5 marks

Expand and simplify:

a. $2(m-4)$
$= 2 \times m - 2 \times 4$ $A = 2m - 8$ ✓
$= 2m - 8$

b. $-3(m-5)+9$
$= -3m + 15 + 9$
$= -3m + 24$

c. $3(m-2)+4(m-2)$
$= (3 \times m - 3 \times 2) + (4 \times m - 4 \times 2)$
$= 3m - 6 + 4m - 8$ ✓
$= 7m - 14$

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