MARCELLIN COLLEGE RANDWICK

YEAR 9

5.3 MATHEMATICS

TASK 1

2017

STUDENT NAME: _____

TEACHER: _____

TOPIC	MARK
Number & Measurement	/17
Algebra	/17
Equations, Inequations & Formula	/22
Total	/56

TIME ALLOWED: 45 minutes
WEIGHTING: 15%

Directions:
- Show all necessary working. Where more than one mark is allocated to a question, full marks may not be awarded for answers only.
- Marks may not be awarded for careless or badly arranged work.
- Calculators may be used

Number & Measurement (17 marks)

1. Evaluate $\dfrac{10 \times 4 - 4 \times 7}{10}$

(1 mark)

2. Rewrite $0.1\overset{..}{7}\overset{.}{3}$ as a fraction.

(2 marks)

3. If 9% of Jordan's money was spent on a $216 air flight to Brisbane, how much money did Jordan have?

(2 marks)

4. Express $5km/h$ in m/sec, correct to 2 decimal places.

(2 marks)

5. State the number of significant figures in each of the following.

   (a) 0.0013 _____

   (b) 35000 *(to the nearest thousand)* _____

   (1 mark each part)

6. Round each of the following to the number indicated in the brackets.

   (a) 0.0035 *(3 decimal places)* _____

   (b) 0.00746 *(1 significant figure)* _____

   (c) 25674 *(4 significant figures)* _____

   (1 mark each part)

7. Convert the following.

   (a) 6.5L to *ml.* _____

   (b) 3400*MB* to *GB.* _____

   (1 mark each part)

8. Write 3.2×10^{-4} as a basic numeral.

   (1 mark)

9. Find the absolute error of 45.3*L*.

   (2 marks)

1. Simplify the following expressions:

   (a) $4x^2 - 3x - x^2 + x$

   (1 mark)

   (b) $2n \times 3nm \div 9m^2n$

   (2 marks)

   (c) $\dfrac{2p-1}{3} - \dfrac{p-4}{4}$

   (2 marks)

2. Expand and simplify the following:

   (a) $7y - 2(y+5)$

   (2 marks)

   (b) $(m+4)(m-1)$

   (2 marks)

(c) $(2x-1)^2 - (2x+1)(2x-1)$

(3 marks)

5. Factorise the following:

(a) $x^2 - 4x$

(1 mark)

(b) $21xy - 3x$

(2 marks)

(c) $m(x+1) - 3(x+1)$

(2 marks)

Equations, Inequations and Formulas (24 marks)

1. Solve the following:

(a) $2m+1=17.$

(2 marks)

(b) $3x+7=5x+14$

(2 marks)

(c) $\dfrac{y-2}{3}=1-y$

(2 marks)

(d) $\dfrac{n-2}{3}+\dfrac{n-3}{5}=-2$

(3 marks)

2. Solve the following inequality and graph the solution on a number line.

$$2(3-x) \leq 20$$

(3 marks)

3. Given that $F = 32 + \dfrac{9C}{5}$, find C when $F = 102$. Correct to 1 decimal place.

(3 marks)

4. Make b the subject of the formula $A = \dfrac{h(a+b)}{2}$

(3 marks)

5. Justin is 6 years older than his sister Chelsea. Their mother is three times Justin's age.

(a) If the sum of the three ages is 79, write an equation to find Justin's age.

(2 marks)

(b) Solve the equation and find each person's age.

(2 marks)

End of Examination

MARCELLIN COLLEGE RANDWICK

YEAR 9

5.3 MATHEMATICS

TASK 1

2017

STUDENT NAME: _SOLUTIONS_

TEACHER:

TOPIC	MARK
Number & Measurement	/17
Algebra	/17
Equations, Inequations & Formula	/22
Total	/56

TIME ALLOWED: 45 minutes
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Directions:
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- Calculators may be used

Number & Measurement (17 marks)

1. Evaluate $\dfrac{10 \times 4 - 4 \times 7}{10}$

$$= \frac{40 - 28}{10} = \frac{12}{10} = \frac{6}{5}$$

(1 mark)

2. Rewrite $0.1\overset{..}{7}\overset{}{3}$ as a fraction.

Let $x = 0.17\dot{3}$

$1000x = 173.7\dot{3}$
$10x = 1.7\dot{3}$
_____
$990x = 172$

$x = \dfrac{172}{990}$

$= \dfrac{86}{495}$

(2 marks)

3. If 9% of Jordan's money was spent on a $216 air flight to Brisbane, how much money did Jordan have?

$9\% \times x = 216$

$0.09x = 216$

$x = \dfrac{216}{0.09}$

$= \$2400$

(2 marks)

4. Express $5km/h$ in m/sec, correct to 2 decimal places.

$5000m / 60 \times 60 sec$

$= 1.39 m/sec$

(2 marks)

Number & Measurement continued

5. State the number of significant figures in each of the following.

   (a) 0.0013   __2__

   (b) 35000 *(to the nearest thousand)*   __2__

   (1 mark each part)

6. Round each of the following to the number indicated in the brackets.

   (a) 0.0035 *(3 decimal places)*   0.004

   (b) 0.00746 *(1 significant figure)*   0.007

   (c) 25674 *(4 significant figures)*   25670

   (1 mark each part)

7. Convert the following.

   (a) 6.5L to ml.   6500 mL

   (b) 3400MB to GB.   3.4 GB

   (1 mark each part)

8. Write 3.2×10^{-4} as a basic numeral.

   0.00032

   (1 mark)

9. Find the absolute error of 45.3L.

   0.05

   (2 marks)

Algebra (17 marks)

1. Simplify the following expressions:

   (a) $4x^2 - 3x - x^2 + x$

   $3x^2 - 2x$

   (1 mark)

   (b) $2n \times 3nm \div 9m^2n$

   $\dfrac{6n^2m}{9m^2n} = \dfrac{2n}{3m}$

   (2 marks)

   (c) $\dfrac{2p-1}{3} - \dfrac{p-4}{4}$

   $\dfrac{4(2p-1) - 3(p-4)}{12}$

   $= \dfrac{8p - 4 - 3p + 12}{12}$

   $= \dfrac{5p + 8}{12}$

   (2 marks)

2. Expand and simplify the following:

   (a) $7y - 2(y+5)$

   $7y - 2y - 10$

   $= 5y - 10$

   (2 marks)

   (b) $(m+4)(m-1)$

   $m^2 - m + 4m - 4$

   $= m^2 + 3m - 4$

   (2 marks)

(c) $(2x-1)^2-(2x+1)(2x-1)$

$$4x^2-4x+1-(4x^2-1)$$

$$= 4x^2-4x+1-4x^2+1$$

$$= 2-4x$$

(3 marks)

5. Factorise the following:

(a) x^2-4x

$$x(x-4)$$

(1 mark)

(b) $21xy-3x$

$$3x(7y-1)$$

(2 marks)

(c) $m(x+1)-3(x+1)$

$$(m-3)(x+1)$$

(2 marks)

Equations, Inequations and Formulas (24 marks)

1. Solve the following:

(a) $2m+1=17$.

$$2m=16$$
$$m=8$$

(2 marks)

(b) $3x+7=5x+14$

$$2x=-7$$
$$x=-\frac{7}{2}$$

(2 marks)

(c) $\dfrac{y-2}{3}=1-y$

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

(2 marks)

(d) $\dfrac{n-2}{3}+\dfrac{n-3}{5}=-2$

(Multiply both sides by 15)

$$5(n-2)+3(n-3)=-2\times15$$
$$5n-10+3n-9=-30$$
$$8n-19=-30$$
$$8n=-11$$
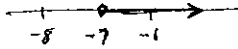$$n=\frac{-11}{8}$$

(3 marks)

2. Solve the following inequality and graph the solution on a number line.

$$2(3-x) \leq 20$$

$$3-x \leq 10$$

$$x-3 \geq -10$$

$$x \geq -7$$

(3 marks)

3. Given that $F = 32 + \dfrac{9C}{5}$, find C when $F = 102$. Correct to 1 decimal place.

$$102 = 32 + \frac{9c}{5}$$

$$\frac{9c}{5} = 70$$

$$9c = 350$$

$$C = \frac{350}{9}$$

$$= 38.9$$

(3 marks)

4. Make b the subject of the formula $A = \dfrac{h(a+b)}{2}$

$$2A = h(a+b)$$

$$\frac{2A}{h} = a+b$$

$$b = \frac{2A}{h} - a$$

(3 marks)

5. Justin is 6 years older than his sister Chelsea. Their mother is three times Justin's age.

(a) If the sum of the three ages is 79, write an equation to find Justin's age.

Let Justin's age be x.

Chelsea's age $= x - 6$

Mother's age $= 3x$.

$$x + x - 6 + 3x = 79$$

$$5x - 6 = 79$$

(2 marks)

(b) Solve the equation and find each person's age.

$$5x = 85$$

$$x = 17$$

(2 marks)

End of Examination