

J.M.J.CH

MARCELLIN COLLEGE RANDWICK



YEAR 9 STAGE 5.2

TERM 2 ASSESSMENT

2017

Weighting: 30% of Assessment Mark.

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STUDENT NAME: \_\_\_\_\_

TEACHER NAME: \_\_\_\_\_

MARK: / 65

PERCENTAGE: %

TIME ALLOWED: 1 hour, 15 minutes.

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 where more than one mark is offered.
- Marks may not be awarded for badly arranged work.
- Calculators are allowed.

**QUESTION 1: NUMBER & MEASUREMENT**

**15 marks**

<p>a) Find 40% of \$325?</p>	1
<p>b) What fraction is 620m of 1.8km? (Answer in simplest form)</p>	1
<p>c) Simplify the following ratios:</p> <p>(i) <math>24 : 45 =</math></p> <p>(ii) <math>3\frac{1}{2} : 2 =</math></p>	1 1
<p>d) Write each number using scientific notation:</p> <p>(i) <math>2340000 =</math></p> <p>(ii) <math>0.00876</math></p>	1 1
<p>e) Convert the following measurements:</p> <p>(i) <math>850m = \underline{\hspace{2cm}} km</math></p> <p>(ii) <math>3.7kL = \underline{\hspace{2cm}} L</math></p>	1 1

f) Kylie wants to average 80% in her four half-yearly exams. Her scores for her first three exams were 67%, 90%, 85% What does she need to score in his final exam to achieve her goal?

2

g) Raymond earned a salary of \$95 000 in 2016. He receives a 5.5% increase in salary in 2017, find his new salary to the nearest dollar.

2

h) A truck travels at a constant speed of 75km/hr. How long will it take to travel 190km? (Answer in hours and minutes)

2

i) John, Gary and Peter share the profits of their company in the ratio of 5: 4: 3. If the total amount they are sharing is \$216 000, how much does each receive? (Answer to the nearest dollar).

3

## QUESTION 2: ALGEBRA &amp; FACTORISING

20 marks

a) Simplify the following:

(i)  $4d - 6y + 9d - 3y =$

1

(ii)  $3fk \times (-2f) =$

1

(iii)  $\frac{14ph^2}{12hp^2} =$

1

b) Expand and simplify where possible:

(i)  $3(a + 4y) =$

1

(ii)  $5(3w + 7) + 11w + 15 =$

2

(iii)  $4(m + 2h) - (h - 3m) =$

2

c) Factorise fully the following:

(i)  $6p + 12ap =$

1

(ii)  $4x + 8 - qx - 2q =$

2

d) Simplify the following algebraic fractions:

(i)  $\frac{y}{8} + \frac{5y}{8} =$

2

(ii)  $\frac{2k}{3} + \frac{3k}{4} =$

2

(iii)  $\frac{7h}{2} \div \frac{h^2}{4} =$

2

(iv)  $\frac{m+2}{3} - \frac{1-m}{2} =$

3

**QUESTION 3: EQUATIONS****20 marks**

a) Solve the following equations to find the value of the pronumeral:

(i)  $3d + 6 = 33$

2

(ii)  $15 + 5r = 24 + 2r$

2

(iii)  $\frac{3d+18}{4} = 12$

3

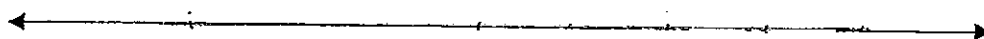
(iv)  $4(2p - 11) + 20 = 54$

3

b) Solve the following inequation and graph it on the number line:

2

$$\frac{11-y}{3} > 10$$



c) If  $A = 2vt + d^2$  find:

(i)  $A$  if  $v = 4$ ,  $t = 3$  and  $d = -2$

(ii)  $d$  if  $A = 960$ ,  $v = 6$  and  $t = 5$

3

d) Solve these equations simultaneously:

3

$$3x + 4y = 6$$

$$x + y = 1$$



## QUESTION 4: INDICES

10 marks

a) Simplify the following:

$$(i) 4d^3g^4 \times 6d^2g = 1$$

$$(ii) 24y^7h^5 \div (-8h^2y) = 1$$

$$(iii) (2m^5d^3)^3 = 1$$

$$(iv) -5h^0 = 1$$

b) Write the following without negative indices:

$$(i) n^{-2} = 1$$

$$(ii) 3f^3w^{-5} = 1$$

$$(iii) \left(\frac{a}{b}\right)^{-2} = 1$$

c) Simplify the following:

$$(i) 16^{\frac{1}{2}} = 1$$

$$(ii) 24g^{\frac{3}{4}} \div 8g^{\frac{1}{4}} = 1$$

$$(ii) (81m^6)^{\frac{1}{2}} = 1$$

Marcellin Year 9 Stage 5.2

Term 2 Assessment

1. Number & Measurement Sample Solutions.

a) 40% of \$325

$$= 0.4 \times 325 = \$130$$

b)  $\frac{620\text{m}}{1800\text{m}} \rightarrow 1.8\text{km} = 1800\text{m} = \frac{21}{90}$

c)  $24:45 = 8:15$

$$3\frac{1}{2}:2 = 7:4$$

} Always whole numbers  
in a simplified ratio!

d) 2340000

i)  $= 2.34 \times 10^6$

ii) 0.00876

$$= 8.76 \times 10^{-3}$$

e. i) 850 m = 0.85 km

ii) 3.7 kL =  $3.7 \times 10^3$  L

$$= 3700 \text{ L}$$

f) She wants to average 80% in her exams.

Let her final exam percentage be 'x'

then 
$$\frac{67 + 90 + 85 + x}{4} = 80$$

$$67 + 90 + 85 + x = 320$$

$$x = 320 - 85 - 90 - 67 \\ = 78\%$$

g) 95000.

We want a 5.5% increase

So the original amount + 5.5% of the original amount

another way to write it is

$$95000 \times 1.055 = \$100225$$

h) 190 km and we are travelling at 75 km/h

$$\frac{190 \text{ km}}{75 \text{ km/h}} = \frac{190 \text{ km} \cdot \text{h}}{75 \text{ km}} = \frac{190}{75} \text{ h} = 2 \frac{8}{15} \text{ hours}$$

$$= 2 \text{ hours } 32 \text{ minutes.}$$

$$i) J = 5$$

$$G = 4$$

$$P = 3$$

$$5 + 4 + 3 = 12$$

= total parts.

$$216000 \div 12 = 18000$$

So 18000

$$J = 5 \times 18000 = 90000$$

$$G = 4 \times 18000 = 72000$$

$$P = 3 \times 18000 = 54000$$

Total.  $\$216000$

So John gets \$90000

Gary gets \$72000

Peter gets \$54000

## 2. Algebra and Factoring

$$a) 4d - 6y + 9d - 3y$$

$$= 13d - 9y$$

$$ii) 3fk \times (-2f)$$

$$= -6f^2k$$

$$iii) \frac{14ph^2}{12hp^2} = \frac{7h}{6p}$$

$$b. i) 3(a+4y)$$

$$= 3a + 12y$$

$$ii) 5(3w+7) + 11w + 15$$

$$= 15w + 35 + 11w + 15$$

$$= 26w + 50$$

$$iii) 4(m+2h) - (h-3m)$$

$$4m + 8h - h + 3m$$

$$= 7m + 7h$$

$$c) 6p + 12ap$$

$$= 6p(1+2a)$$

$$ii) 4x + 8 - 9x - 29$$

$$= 4(x+2) - 9(x+2)$$

$$= (4-9)(x+2)$$

$$d) i) \frac{y}{8} + \frac{5y}{8} = \frac{6y}{8} = \frac{3y}{4}$$

$$ii) \frac{2k}{3} + \frac{3k}{4} = \frac{4(2k)}{4(3)} + \frac{3(3k)}{3(4)}$$

$$= \frac{8k}{12} + \frac{9k}{12} = \frac{17k}{12}$$

$$\text{iii) } \frac{7h}{2} = \frac{h^2}{4}$$

$$= \frac{7h}{2} \times \frac{4}{h^2}$$

$$= \frac{28h}{2h^2} = \frac{14}{h}$$

$$\text{iv) } \frac{m+2}{3} - \frac{1-m}{2}$$

$$= \frac{2(m+2)}{2(3)} - \frac{3(1-m)}{3(2)}$$

$$= \frac{2m+4}{6} - \left( \frac{3-3m}{6} \right)$$

$$= \frac{2m+4-3+3m}{6}$$

$$= \frac{5m+1}{6}$$

Part 3: EQUATIONS.

$$\text{a) i) } 3d + 6 = 33$$

$$3d = 33 - 6 = 27$$

$$d = \frac{27}{3} = 9$$

$$\text{ii) } 15 + 5r = 24 + 2r$$

$$5r - 2r = 24 - 15$$

$$3r = 9$$

$$r = \frac{9}{3} = 3$$

$$\text{iii) } \frac{3d+18}{4} = 12$$

$$3d+18 = 12 \times 4 = 48$$

$$3d = 48 - 18$$

$$3d = 30$$

$$d = \frac{30}{3} = 10$$

$$\text{iv) } 4(2p-11) + 10 = 54$$

$$4(2p-11) = 54 - 10 = 44$$

$$4(2p-11) = 44$$

$$(2p-11) = \frac{44}{4} = 11$$

$$2p - 11 = 11$$

$$2p = 11 + 11 = 22$$

$$2p = 22$$

$$p = \frac{22}{2} = 11$$

b)

$$\frac{11-y}{3} > 10$$

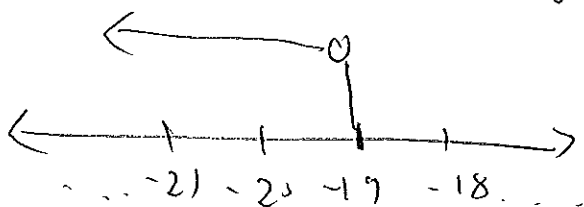
$$11-y > 30$$

$$-y > 30-11 = 19$$

$$-y > 19$$

$$y < -19$$

When you multiply both sides by  $-1$ , remember to reverse the sign!



c)  $A = 2vt + d^2$

i)  $v = 4, t = 3, d = -2$

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

$$= 2(12) + 4$$

$$= 24 + 4 = 28$$

ii)  $A = 960, v = 6, t = 5$

$$960 = 2(6)(5) + d^2$$

$$960 - 60 = d^2 \rightarrow d^2 = 900$$

$$d = \pm 30$$

d)  $3x + 4y = 6$  (1)

$$x + y = 1$$
 (2)

in (2)

$$x = 1 - y$$

sub into (1)

$$3(1-y) + 4y = 6$$

$$3 - 3y + 4y = 6$$

$$y = 6 - 3 = 3$$

$$\therefore x = -2$$

$$\text{test } 3(-2) + 4(3) = 6 \checkmark$$

$$-2 + 3 = 1$$

4. indices

a)  $4d^3g^4 \times 6d^2g$

$$24d^5g^5$$

ii)  $\frac{24y^7h^5}{-8h^2y}$

$$-3y^6h^3$$

$$= -3y^6h^3$$

$$\text{ii)} (2m^5d^3)^3 \\ = 8m^{15}d^9$$

$$\text{iii)} (81m^6)^{\frac{1}{2}} \\ = 9m^3$$

$$\text{iv)} -5h^0 = -5(1) = -5$$

$$\text{b. i)} n^{-2} = \frac{1}{n^2}$$

$$\text{ii)} 3f^3w^{-5} \\ = \frac{3f^3}{w^5}$$

$$\text{iii)} \left(\frac{a}{b}\right)^{-2} = \left(\frac{a^2}{b^2}\right)^{-1} \\ = \frac{b^2}{a^2}$$

$$\text{c) i)} 16^{\frac{1}{2}} = \sqrt{16} = 4$$

$$\text{ii)} 24g^{\frac{3}{4}} \div 8g^{\frac{1}{4}} \\ = 3g^{\frac{1}{2}} = 3\sqrt{g}$$