

# Carlingford High School



## Mathematics

### Modified

### Year 9 Term 4 Examination

### 2018

Name: \_\_\_\_\_

Class: 9MA\_1\_1

Teacher: Ms Strilakos

- Time allowed: 50 minutes
- Calculators allowed
- Show all necessary working
- Use blue or black pen to write your answers

Topic	INDICES	RATIO AND RATES	TOTAL
TOTAL	/57	/46	/103

## INDICES

Q.1

- (i) How many times is the pronumeral  $k$  multiplied by itself in the following statement?

$$k \times k \times k \times k$$

- (ii) Hence complete the following statement by writing the correct number in the box for the index:

$$k \times k \times k \times k = k^{\square}$$

(Expanded form)      (Index form)

[2]

Q.2 Express each of the following in index form:

(i)  $a \times a \times a \times a$

(ii)  $r \times r \times r \times s \times s$

(iii)  $2 \times 4 \times y \times y \times y \times y$

(iv)  $3 \times m \times m \times 5 \times m$

[4]

Q.3 Simplify:

(i)  $3^4 \times 3^2 = 3^{\square}$

(ii)  $n^3 \times n^5$

(iii)  $p^4 \times p$

(iv)  $3a^2 \times a^5$

(v)  $3m^3 \times 4m^6 = \_ \times \_ m^{\square}$   
 $= \_ m^{\square}$

(vi)  $4w^3 \times 2w^4$

(vii)  $-5m^2n^3 \times 4m^4n^3$

[4+2+2+2]

Q.4 Simplify:

(i)  $y^5 \div y^2$

(ii)  $\frac{c^8}{c^3}$

(iii)  $\frac{y^7}{y^{-2}}$

(iv)  $15c^4 \div 5c^2$

(v)  $12m^8 \div 3m^4$

(vi)  $18a^{12} \div (-2a^5)$

(vii)  $\frac{20b^7}{4b^2}$

[1+1+1+2+2+2+2]

Q.5 Simplify:

(i)  $(m^3)^4$

(ii)  $(2a^2)^3$

[1+2]

Q.6 Simplify:

(i)  $\left(\frac{3}{m^2}\right)^4$

(ii)  $\left(\frac{w^8}{4}\right)^2$

[2]

Q.7 Write with a positive index:

(i)  $3^{-4}$

(ii)  $4^{-2}$

(iii)  $(2m)^{-7}$

(iv)  $5w^{-4}$

[4]

Q.8 Find the value of:

(i)  $3^0$

(ii)  $y^0$

(iii)  $6m^0$

(iv)  $(3a)^0$

[4]

Q.9 Simplify:

(i)  $4^6 \times 4^{-2} = 4$

(ii)  $x^{-2} \times x^{-5}$

(iii)  $w^3 \times w^0$

[3]

Q.10 Simplify:

(i)  $(2^4)^3$

(ii)  $(4^5)^2$

(iii)  $(7^{-2})^0$

(iv)  $(x^{-4})^{-2}$

[4]

Q.11 Round each number to three significant figures:

(i) 48 231

(ii) 68 473

(iii) 2 087 342

(iv) 0.00264853

[4]

Q.12 Write each number using scientific notation:

(i) 14 000 =  $1.4 \times 10^{\square}$

(ii) 624 000

(iii) 0.000425

[3]

Q.13 Write each number as a basic numeral:

(i)  $4 \times 10^2$

(ii)  $3.8 \times 10^3$

(iii)  $6 \times 10^{-4}$

[3]

## RATIOS

Q.1 Write each ratio in simplest form:

(i) 10 : 30 = 1 : \_\_\_\_

(ii) 6 : 12

(iii) 24 : 4

(iv) 0.2 : 0.5

(v) 0.04 : 6

[1+1+1+2+2]

Q.2 Simplify each ratio, remembering to make the units **within** the ratio the same first:

(i) 6mm : 1 cm (Write the cm as mm first)

(ii) 480 m : 1 km (Change the km to m first)

(iii) \$2.40 : \$3.00

(iv) 36 sec : 2 min

(v) 9 months : 3 years

[5 X 2]

Q.3 Jennifer and Maurice share the rent of a business office in the ratio 4 : 5.

The rent is \$3 600 each month.

- (i) How many parts are there in total in the ratio 4 : 5?
- (ii) What is the value in dollars (\$) of one part?
- (iii) How much of the total rent does Jennifer pay?

[3]

Q.4 Complete each of the following sentences:

- (i) \$2 for 2 oranges is a rate of

\$\_\_\_for 1 orange

- (ii) \$4 for 8 apples is a rate of

\_\_ cents for 1 apple

- (iii) 666km in 6 hours is a rate of

\_\_\_km/hr

(iv) \$20 for 10 kg of flour is a rate of

\$\_\_\_/kg

(v) \$48 for 4 hours work is a rate of

\$\_\_\_/hr

(vi) \$784 for 4 days at a hotel is

\$\_\_\_/day

[6]

Q.5 A plumber took six hours to complete a job.

If he charged \$576 for the job, what was the rate he charged per hour?

[2]

Q.6 Cordial is mixed with water in the ratio 1 : 4.

If 30 ml of cordial is used to make a glass of cordial, how many ml of water must be used?

[1]

Q.7 Ken and Peter share profits from a garage sale in the ratio 4 : 7.

If Ken receives \$248, how much does Peter receive?

[2]

Q.8 A tree is drawn to a scale of 1 : 50.  
If its height is drawn as a scaled height of 10cm

(i) how many cm tall is the tree in real life?

(ii) What is this height in **metres**?

[2]

Q.9 \$8400 is to be divided between Sam and Jed in the ratio 7 : 5.

(i) How many parts in this ratio?

(ii) What is the value of one part?

(iii) How much does each boy get?

[4]

Q.10 If \$2800 is to be shared between three people in the ratio 2 : 5 : 7

(i) How many parts in the ratio?

(ii) What is the value of one part?

(iii) How much is the largest share?

(iv) How much is the smallest share?

[4]

Q.11 A car travels a distance of 240 km in 2 hours.

(i) How far is it travelling in one hour?

(ii) How far does it travel in one minute?

[2]

Q.12 Lilli takes one hour to walk 4 km and another one hour to cycle 8 km.

- (i) What is the total distance travelled?
- (ii) What was the total time taken to travel this total distance?
- (iii) What was her average speed across the total distance?



End of Test