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?

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

4 1

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

$$k \times k \times k \times k = k^{\boxed{4}}$$

1

(Expanded form) (Index form)

(2)

[2]

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

(i) $a \times a \times a \times a$ a^4 1

(ii) $r \times r \times r \times s \times s$ r^3s^2 1

(iii) $2 \times 4 \times y \times y \times y \times y$ $8y^4$ 1

(iv) $3 \times m \times m \times 5 \times m$ $15m^3$ 1

(4)

[4]

Q.3 Simplify:

(i) $3^4 \times 3^2 = 3^{\boxed{6}}$ 1

(ii) $n^3 \times n^5 = n^8$ 1

(iii) $p^4 \times p = p^5$ 1

(iv) $3a^2 \times a^5 = 3a^7$ 1

(v) $3m^3 \times 4m^6 = \underline{3} \times \underline{4}m^{\boxed{9}}$ 1

$= \underline{12}m^{\boxed{9}}$ 1

(vi) $4w^3 \times 2w^4 = 8w^7$ 2

(vii) $-5m^2n^3 \times 4m^4n^3 = -20m^6n^6$ 2

(10)

[4+2+2+2]

Q.4 Simplify:

(i) $y^5 \div y^2 = y^3$ 1

(ii) $\frac{c^8}{c^3} = c^5$ 1

(iii) $\frac{y^7}{y^{-2}} = y^9$ 1

(iv) $15c^4 \div 5c^2 = 3c^2$ 2

(v) $12m^8 \div 3m^4 = 4m^4$ 2

(vi) $18a^{12} \div (-2a^5) = -9a^7$ 2

(vii) $\frac{20b^7}{4b^2} = 5b^5$ 2

(11)

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

Q.5 Simplify:

(i) $(m^3)^4 = m^{12}$ 1

(ii) $(2a^2)^3 = 8a^6$ 2

(3)

[1+2]

Q.6 Simplify:

(i) $\left(\frac{3}{m^2}\right)^4 = \frac{81}{m^8}$ 1

(ii) $\left(\frac{w^8}{4}\right)^2 = \frac{w^{16}}{16}$ 1

(2)

[2]

Q.7 Write with a positive index:

(i) $3^{-4} = \frac{1}{3^4}$ 1

(ii) $4^{-2} = \frac{1}{4^2}$ 1

(iii) $(2m)^{-7} = \frac{1}{(2m)^7} = \frac{1}{2^7 m^7}$ 1

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

$= \frac{5}{w^4}$ 1

[4]

(4)

Q.8 Find the value of:

(i) $3^0 = 1$ 1

(ii) $y^0 = 1$ 1

(iii) $6m^0 = 6$ 1

(iv) $(3a)^0 = 1$ 1

(4)

[4]

Q.9 Simplify:

(i) $4^6 \times 4^{-2} = 4^4$ 1

(ii) $x^{-2} \times x^{-5} = x^{-7}$ 1

(iii) $w^3 \times w^0 = w^3$ 1

(3)

[3]

Q.10 Simplify:

(i) $(2^4)^3 = 2^{12}$ 1

(ii) $(4^5)^2 = 4^{10}$ 1

(iii) $(7^{-2})^0 = 1$ 1

(iv) $(x^{-4})^{-2} = \frac{1}{(x^{-4})^2} = x^8$

$= x^8$ 1

[4]

(4)

Q.11 Round each number to three significant figures:

(i) 48 231 = 48200

(ii) 68 473 = 68500

(iii) 2 087 342 = 2090000

(iv) 0.00264853 = 0.00265

[4]

Q.12 Write each number using scientific notation:

(i) $14\,000 = 1.4 \times 10^{4}$

(ii) 624 000 = 6.24×10^{5}

(iii) 0.000425 = 4.25×10^{-4}

[3]

Q.13 Write each number as a basic numeral:

(i) 4×10^{2} = 400

(ii) 3.8×10^{3} = 3800

(iii) 6×10^{-4} = 0.0006

[3]

RATIOS

Q.1 Write each ratio in simplest form:

(i) 10 : 30 = 1 : 3

(ii) 6 : 12 = 1 : 2

(iii) 24 : 4 = 6 : 1

(iv) 0.2 : 0.5 = 2 : 5

(v) 0.04 : 6 = 4 : 600 = 1 : 150

[1+1+1+2+2] (7)

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)

= 6 : 10

= 3 : 5

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

= 480 : 1000

= 48 : 100

= 12 : 25

(iii) \$2.40 : \$3.00

= 24 : 30

= 4 : 5

(iv) 36 sec : 2 min

= 36 : 120

= 3 : 10

(v) 9 months : 3 years

÷ 9 : 36

= 1 : 4

[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? 9

(ii) What is the value in dollars ($) of one part?

3600 ÷ 9 = $400

(iii) How much of the total rent does Jennifer pay?

4x400 = $ 1600

[3]

Q.4 Complete each of the following sentences:

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

$ 1 for 1 orange

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

50 cents for 1 apple

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

111 km/hr

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

$ 2 /kg

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

$ 12 /hr

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

$ 196 /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?

576 ÷ 6 = $96 /hr.

[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?

C:W

= 1 : 4

= 30 : 4x30

∴ 120ml 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?

$4:7 = 248:P$

$\frac{248}{4} = 62$ $\quad$ $P = 7 \times 62$

$= \$434$

[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?

$1:50 = 10\,cm : x$

$x = 500\,cm = 5\,m$

500cm

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

5m [2]

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

(i) How many parts in this ratio?

12

(ii) What is the value of one part?

$8400 \div 12 = 700$

(iii) How much does each boy get?

Sam: $7 \times 700 = 4900$

Jed: $5 \times 700 = 3500$

[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?

14

(ii) What is the value of one part?

$2800 \div 14 = 200$

(iii) How much is the largest share?

$7 \times 200 = 1400$

(iv) How much is the smallest share?

$2 \times 200 = 400$

[4]

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

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

120 km

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

$120 \div 60 = 2\,km/min.$

[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?

12 km

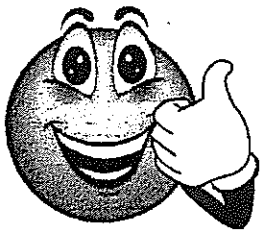
(ii) What was the total time taken to travel this total distance?

2 hrs.

(iii) What was her average speed across the total distance?

$\frac{12}{2} = 6$ km/hr.

[3]



End of Test