Carlingford High School

Mathematics
Year 9 5.2 Term 4 Test
2016

Student Name: _____

Circle your Teacher below.

Miss Nicolaou Mr Wilson Mrs Young/ Mrs Wilson

Time allowed: **55 minutes**

- Complete the examination in blue or black pen.
- Show all necessary working.
- Attempt all questions.
- Extension questions are marked with an asterisk *.
- Diagrams are not to scale.

	Statistics	Indices	Rates and Ratio	Total	
Multiple Choice	/2	/2	/2	/6	
Questions	/21	/24	/17	/62	
Extension	/5	/3	/4	/12	
Total	/28	/29	/23	/80	%

Multiple Choice

Circle the correct answer.

1. The data below shows the number of pets that live in each house in a small street.

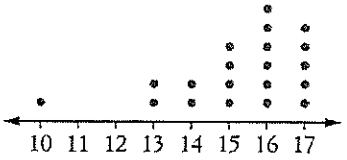
   0, 0, 1, 3, 2, 1, 11, 2

   The outlier in this data has:

   A the greatest effect on the mean
   B the greatest effect on the mode
   C the greatest effect on the median
   D has an equal effect on the mean, mode and median.

1

2.



For this statistical distribution the shape is:

A positively skewed
B negatively skewed
C normally distributed
D symmetrical

1

3. Find $(2x^2)^3$

   A $2x^5$ C $6x^5$
   B $2x^6$ D $8x^6$

1

4. How many significant figures in 0.00607?

   A 6 C 3
   B 5 D 2

1

5. $650 is divided in the ratio 6:7. The largest share would be:

   A $50 C $350
   B $300 D $600

1

6. Convert 5m/s to km/h.

   A 18km/h C 48km/h
   B 36km/h D 96km/h

1

Statistics

1. In eight Mathematics tests Jane had the following scores:

   45, 62, 80, 56, 73, 56, 70, 54

   Calculate the:

   (a) mean=

   (b) mode=

   (c) median=

   (d) range=

4

2. Complete the following frequency table and use your answers to calculate the mean.

Score, x	Frequency, f	fx
2	5	
3	8	
4	4	
5	2	
6	5	
7	1	
	$\sum f=$	$\sum fx=$

mean=

3

3. The stem and leaf plot shows runs scored by Michael and Ricky.

Runs scored

Michael	Stem	Ricky
	0	0
9 5 2	1	9
9 8 7 7 6	2	3 8
6 5 2	3	7 8 8 9 9
2 1	4	1 3 6
	5	2

(a) Ricky's lowest score =

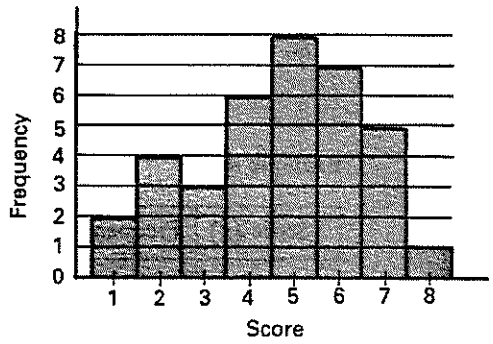
(b) Michaels highest score =

(c) Michael's median score=

(d) Ricky's mean score = (correct to one decimal place)

4

4. Use the histogram to complete the frequency table below:



Score	Frequency	Cumulative Frequency
1		
2		
3		
4		
5		
6		
7		
8		

Hence find the:

(a) mode =

(b) median =

(c) range = 5

5. Decide if you would use a **census** or a **sample** to investigate:

(a) the number of students at a high school.

(b) a favourite car brand. 2

6. Classify each type of data as **categorical** or **numerical (quantitative)**:

(a) the rainfall in NSW

(b) types of cake 2

7. Consider the population of a particular high school.

Year	Students
7	146
8	158
9	153
10	155
11	130
12	132

(a) How many students are in the school? 1

*(b) What percentage of the school are in:
(i) Year 9?
(correct to one decimal place)

(ii) Years 11 and 12?
(correct to one decimal place) 2

*(c) A sample of 200 students was surveyed on the amount of time they watch television. How many students should be selected from Year 9? 3

Indices

1. Write your answer in **index notation**:

(a) $5^3 \times 5^4 =$

(b) $y^3 \times y^2 =$

(c) $m^4 \times m \times m =$

(d) $8p^2 \times 7p^5 =$

(e) $8^5 \div 8 =$

(f) $a^2 \div a^6 =$

(g) $35d^5 \div 7d^2 =$

(h) $\frac{10x^4}{15x^2} =$

(i) $(5^2)^4 =$

(j) $(b^3)^2 =$

(k) $(2k^3)^3 =$

(l) $x^0 =$

(m) $7y^0 =$ **13**

2. Write with a **negative** index:

(a) $\frac{1}{6} =$

(b) $\frac{x}{y} =$ **2**

3. Write with a **positive** index:

(a) $7x^{-2} =$

(b) $(2x^3)^{-4} =$ **2**

4. Write these numerals in scientific notation:

(a) 8 000 000 000 =

(b) 576 000=

(c) 0.000 04 =

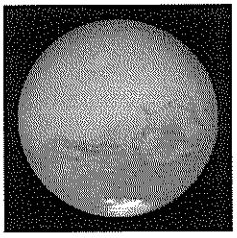
(d) 0.000 000 92 = **4**

5. Write as a basic numeral:

(a) $3.4 \times 10^6 =$

(b) $7 \times 10^{-4} =$ **2**

6. At its closest distance Mars is 56 million kilometres from Earth.



(a) Write this distance in scientific notation. **1**

* (b) If a space probe left Earth travelling at 58 000km/h how many full days would it take to reach Mars? **3**

Rates and Ratio

1. Simplify the following ratios:

(a) 15 : 48=

(b) 72 : 24=

(c) 120 : 25=

(d) 18 : 15 : 3 =

(e) $\frac{4}{5} : \frac{1}{4} =$

(f) 0.4 : 44=

(g) 4hours : 2 days =

(h) $1\frac{1}{4}$ minutes : 10 s =

8

2. John and Fiona divided money in the ratio 3 : 5. If John received $240 how much did Fiona receive?

2

3. Divide $48 in the ratio 5 : 7.

2

4. Simplify the following rates:

(a) $600 in 32hours =

(b) $42 for 5kg =

(c) 200km on 25L =

3

4. A car travels 120m in 10 seconds. What is this speed in km/h?

2

* 5. A tap is leaking at a rate of 1 litre every 8 hours. How long will it take to leak a total of 300mL? Give your answer in hours and minutes.

2

* 6. The ratio of Julie's age to Peter's age is 5 : 8 and the ratio of Peter's age to Sarah's age is 7 : 3. If the sum of their ages is 115 years, how old is Peter?

2

-END OF TEST-

Carlingford High School

Mathematics
Year 9 5.2 Term 4 Test
2016

Student Name: ANSWER SHEET

Circle your Teacher below.

Miss Nicolaou Mr Wilson Mrs Young/ Mrs Wilson

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1. The data below shows the number of pets that live in each house in a small street.

   0, 0, 1, 3, 2, 1, 11, 2

   The outlier in this data has:

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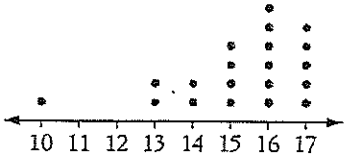
2. 

   For this statistical distribution the shape is:

   A positively skewed
   (B) negatively skewed
   C normally distributed
   D symmetrical

3. Find $(2x^2)^3$

   A $2x^5$ C $6x^5$
   B $2x^6$ (D) $8x^6$

4. How many significant figures in 0.00607?

   A 6 (C) 3
   B 5 D 2

5. $650 is divided in the ratio 6:7.
   The largest share would be:

   A $50 (C) $350
   B $300 D $600

6. Convert 5m/s to km/h.

   (A) 18km/h C 48km/h
   B 36km/h D 96km/h

Mrs Young / Ms Wilson Statistics

1. In eight Mathematics tests Jane had the following scores:
   45, ~~54~~, 56, 56 62 70 73 80
   45, 62, 80, 56, 73, 56, 70, 54

   Calculate the:

   (a) mean= $\frac{496}{8} = 62$

   (b) mode= 56

   (c) median= $\frac{56+62}{2} = 59$

   (d) range= $80-45=35$

2. Complete the following frequency table and use your answers to calculate the mean.

Score, x	Frequency, f	fx
2	5	10
3	8	24
4	4	16
5	2	10
6	5	30
7	1	7
	$\Sigma f = 25$	$\Sigma fx = 97$

   mean= $\frac{97}{25} = 3.88$

3. The stem and leaf plot shows runs scored by Michael and Ricky.

Runs scored

Michael	Stem	Ricky
	0	0
9 5 2	1	9
9 (8) 7 7 6	2	3 8
6 5 2	3	7 8 8 9 9
2 1	4	1 3 6
	5	2

   (a) Ricky's lowest score = 0

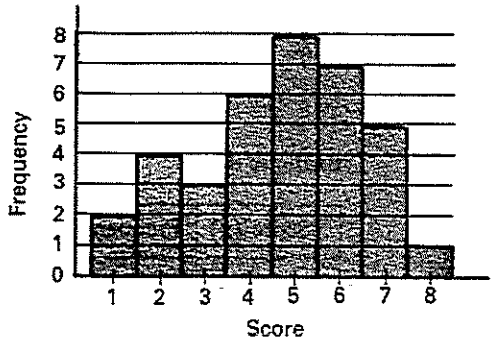
   (b) Michaels highest score = 42

   (c) Michael's median score= 28

   (d) Ricky's mean score = $\frac{443}{13}$
   (correct to one decimal place)
   $\doteq 34.07692308$
   $\doteq 34.1$ (1dp)

1 1 1 1 1 4 3 4

4. Use the histogram to complete the frequency table below:



Score	Frequency	Cumulative Frequency
1	2	2
2	4	6
3	3	9
4	6	15
5	8	23
6	7	30
7	5	35
8	1	36

Hence find the:

(a) mode = 5

(b) median = 5

(c) range = 8 - 1 = 7

5

5. Decide if you would use a **census** or a **sample** to investigate:

(a) the number of students at a high school.

census

(b) a favourite car brand.

sample

2

6. Classify each type of data as **categorical** or **numerical (quantitative)**:

(a) the rainfall in NSW numerical

(b) types of cake categorical

2

7. Consider the population of a particular high school.

Year	Students
7	146
8	158
9	153
10	155
11	130
12	132

(a) How many students are in the school?

874

1

*(b) What percentage of the school are in:

(i) Year 9?
(correct to one decimal place)

$\frac{153}{874} \times 100 \doteq 17.5\%$

(ii) Years 11 and 12?
(correct to one decimal place)

$\frac{262}{874} \times 100 \doteq 30.0\%$.

2

*(c) A sample of 200 students was surveyed on the amount of time they watch television. How many students should be selected from Year 9?

$\frac{153}{874} \times 200$ (1)

$= 35.01144165$

$\therefore$ 35 students should be selected.

3

[Mr Wilson]

Indices

1. Write your answer in **index notation**:

(a) $5^3 \times 5^4 = 5^7$

(b) $y^3 \times y^2 = y^5$

(c) $m^4 \times m \times m = m^6$

(d) $8p^2 \times 7p^5 = 56p^7$

(e) $8^5 \div 8 = 8^4$

(f) $a^2 \div a^6 = a^{-4}$

(g) $35d^5 \div 7d^2 = 5d^3$

(h) $\frac{10x^4}{15x^2} = \frac{2x^2}{3}$

(i) $(5^2)^4 = 5^8$

(j) $(b^3)^2 = b^6$

(k) $(2k^3)^3 = 8k^9$

(l) $x^0 = 1$

(m) $7y^0 = 7$

13

2. Write with a **negative** index:

(a) $\frac{1}{6} = 6^{-1}$

(b) $\frac{x}{y} = xy^{-1}$

2

3. Write with a **positive** index:

(a) $7x^{-2} = \frac{7}{x^2}$

(b) $(2x^3)^{-4} = \frac{1}{16x^{12}}$

2

4. Write these numerals in scientific notation:

(a) 8 000 000 000 = 8×10^9

(b) 576 000 = 5.76×10^5

(c) 0.000 04 = 4×10^{-5}

(d) 0.000 000 92 = 9.2×10^{-7}

4

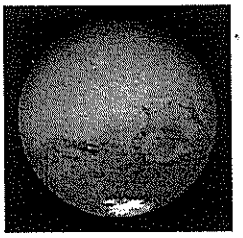
5. Write as a basic numeral:

(a) 3.4×10^6 = 3 400 000

(b) 7×10^{-4} = 0.000 7

2

6. At its closest distance Mars is 56 million kilometres from Earth.



(a) Write this distance in scientific notation.

5.6×10^7 km.

1

* (b) If a space probe left Earth travelling at 58 000km/h how many full days would it take to reach Mars?

$T = \frac{D}{S}$

$= \frac{5.6 \times 10^7}{58000}$

$= 965.5172414$ h

$= 40.22988506$

$\doteq$ 40 days.

3

[Ms Nicolaou]

Rates and Ratio

1. Simplify the following ratios:

(a) 15 : 48= 5:16

(b) 72 : 24= 3 : 1

(c) 120 : 25= 24:5

(d) 18 : 15 : 3 = 6: 5: 1

(e) $\frac{4}{5} : \frac{1}{4}$ = 16:5

(f) 0.4 : 44= 1:110

(g) 4hours : 2 days = 1 : 12

(h) $1\frac{1}{4}$ minutes : 10 s = 75:10
= 15:2

8

2. John and Fiona divided money in the ratio 3 : 5. If John received $240 how much did Fiona receive?

3 parts = $240
1 part = $80
5 parts = $400

Fiona received $400

2

3. Divide $48 in the ratio 5 : 7.

12 parts = $48
1 part = $4
5 parts = $20
7 parts = $28

Ans
$20 : $28

2

4. Simplify the following rates:

(a) $600 in 32hours = $18.75/h

(b) $42 for 5kg = $8.40/kg

(c) 200km on 25L = 8km/L.

3

4. A car travels 120m in 10 seconds. What is this speed in km/h?

Speed = 120m x 6 x 60
= 43 200 m/h
= 43.2 km/h.

2

* 5. A tap is leaking at a rate of 1 litre every 8 hours. How long will it take to leak a total of 300mL? Give your answer in hours and minutes.

1000mL in 8h
100 mL in $\frac{8}{10}$h
300mL in $\frac{8}{10}$ x 3 h

ANS 2.4h
2h and 24mins

2

* 6. The ratio of Julie's age to Peter's age is 5 : 8 and the ratio of Peter's age to Sarah's age is 7 : 3. If the sum of their ages is 115 years, how old is Peter?

J : P : S
5 : 8 (x 7)
7 : 3 (x 8)
35 : 56
56 : 24

Ratio 35 : 56 : 24

115 parts = 115 years

∴ Peter is 56 yrs old

2

-END OF TEST-