BRIGIDINE COLLEGE

MATHEMATICS
YR 9 HALF-YEARLY EXAM 2017
TIME ALLOWED: 50 minutes

Student:

Teacher:

LL SECTIONS TO BE ANSWERED ON THE QUESTION PAPER IN THE SPACE
ROVIDED.

Section	Marks	Student's mark
Statistics	20	
Indices & Probability	13	
Geometry & Number	14	
Non-Calculator	15	

All necessary working MUST be shown in Short/Extended response sections.
Black/blue pen MUST be used for all working and answers.
Calculator allowed.

SECTION 1: STATISTICS   Teacher:_____

MULTIPLE CHOICE: CIRCLE THE CORRECT ANSWER   20 MARKS
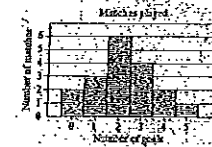
1. What is the median of 12, 20, 9, 4, 16, 11 and 13?

    A. 4   B. 11   C. 12   D. 13

---

2. The mean of five scores is 4. What is the missing score if four of the scores are 2, 5, 5 and 7?

    A. 1   B. 2   C. 4   D. 5

---

3. From this frequency histogram, the total number of matches played was:

    A. 17   B. 5   C. 6   D. 18

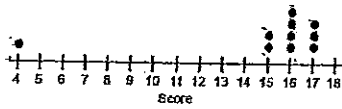4. The interquartile range of the scores 5, 5, 6, 7, 7, 7, 8, 8, 9 is:

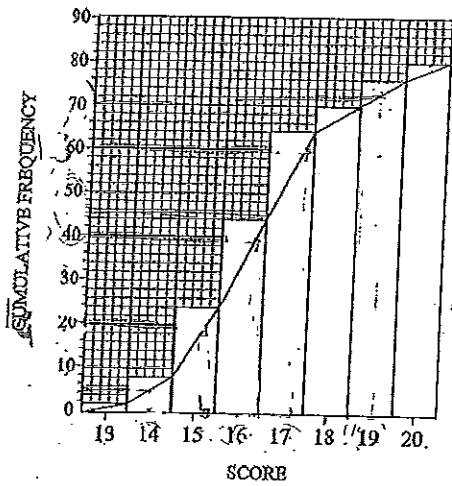   A. 2   B. 2.5   C. 3   D. 4

5. If the outlier is removed, which of these statements are true.

Score

A. The mean will not change   B. The median will change

C. The mode will not change   D. The range will not change

SHORT/EXTENDED ANSWER: SHOW WORKING

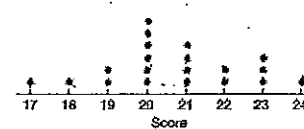6. Use the cumulative frequency histogram and polygon provided to determine the interquartile range of the data.

7.

Class	Class Centre	Frequency	Cumulative Frequency
1 - 5		11	
6 - 10		18	
11 - 15		22	
16 - 20		10	
21 - 25		7	

a. Complete the *class centre* and *cumulative frequency* columns in the frequency distribution table above.

b. Determine the median class.

8. a. Use the dot plot to find the 5 number summary for the scores.

Score

b. Use the 5 number summary to construct a box and whisker plot for the scores.

c. Use the box and whisker plot to find the Interquartile range.

d. What percentage of the scores lie between 20 and 22?

e. What is the median?

SECTION 2: Indices & Probability   Teacher:_____ __ _____

MULTIPLE CHOICE: CIRCLE THE CORRECT ANSWER   14 MARKS

1. If one letter is selected at random from those making up the word EXCITEMENT, what is the probability that it is *not* a vowel (I or E)?

   A. $\dfrac{1}{5}$ B. $\dfrac{2}{5}$ C. $\dfrac{1}{2}$ D. $\dfrac{3}{5}$

2. If E is the event 'a number less than 3' when a 6-sided die is rolled, then the complement of this event is:

   A. {1, 2, 3}   B. {3, 4, 5, 6}   C. {5, 6}   D. {1, 2, 3, 4}

4. $(5a^3b^2)^2$ simplifies to:

   A. $10a^6b^4$ B. $25a^6b^4$ C. $10a^5b^4$ D. $25a^5b^4$

5. $2^3 \times 2^5$ simplifies to:

   A. 2^2 B. 2^8 C. 2^{15} D. 4^8

SHORT/EXTENDED ANSWER: SHOW WORKING

6. A card is chosen from a normal playing pack. Determine the probability that the card is:

   a. The jack of hearts

   b. A heart and a picture card

7. A coin is tossed and a dice is rolled.

   a. List the sample space using a tree diagram.

   b. What is the probability of getting a 6 and a tail?

8. Simplify

$$\frac{14a^6}{21a^2}$$

9. Simplify $3y^0 + (3y)^0$

10. Write $36q^{-4}$ without the negative index.

Student:

SECTION 3: Geometry & Number

Teacher:

MULTIPLE CHOICE: CIRCLE THE CORRECT ANSWER   14 MARKS
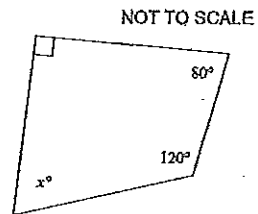
1. A mixed touch football has 4 boys and 6 girls. The simplest ratio of girls to boys is:

    A. $2:3$ B. $4:6$ C. $6:4$ D. $3:2$

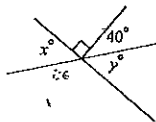2. When $650 is increased by 10% then the result decreased by 10% the final amount is:

    A. $60.50   B. $600   C. $650   D. $643.50

3. What is the value of x?

    NOT TO SCALE

    A. 40   B. 50   C. 70   D. 90
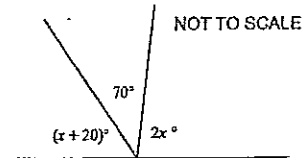
4. What is the value of $x + y$ from the diagram?

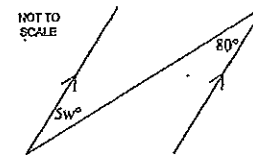
    A. 90   B. 100   C. 180   D. 230

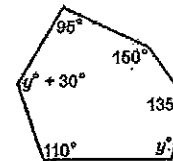## SHORT/EXTENDED ANSWER: SHOW WORKING

5. Find the value of x.

    NOT TO SCALE

    2

6. For the diagram shown, determine the value of w. Give a reason for your answer.

    NOT TO SCALE

    2

7. Find the value of y in the following polygon.

8. The exterior angle of a regular polygon is $18°$. How many sides does it have?

9. Write 0.617 as a fraction.

10. Complete the equivalent rate:

$15\text{m/s} = $ [   ] km/hr

Write ANSWER ONLY in the Answer Column. Show working in the Question column.

	Question	Answer
1	Simplify $17\,000 \times 200 =$	
2	Increase $75 by 10%	
3	The diameter of a microscopic particle is 0.000 072 metres. Write the number in scientific notation.	
4	Simplify the ratio 32:48	
5	You are making your own dressing for a salad. Here is a recipe for 100 millilitres (mL) of dressing.	

Salad oil:	60 mL
Vinegar:	30 mL
Soy sauce:	10 mL

How many millilitres (mL) of salad oil do you need to make 150 mL of this dressing?

	Question	Answer
6	Write an algebraic expression for : "add twice a to b and divide the result by 5"	
7	Simplify: $5^0 + 7$	
8	A coin is tossed 3 times. There are 8 possible outcomes. What is the probability of getting 2 tails and 1 head in any order?	

9	In a netball competition, each of the 8 teams must play each of the other 7 teams *once*. How many games must be played?
10	Arrange the numbers below in ascending order. $19, 33\frac{1}{3}\%, \frac{2}{3}, 1, 19\%$
11	When $t = 4$ and $w = -4$, what is the value of $t^2 + w^2$?
12	Find the probability of rolling a 3 on a standard six – sided die?
13	The area of a rectangle is $98\,cm^2$. ███ 7cm What is the length of the rectangle, if the width is 7cm?
14	A tin contains 15 green, 10 red, 7 black and 18 white jelly beans. Without looking, Jen takes one jelly bean from the tin. What is the probability that the jelly bean is red?
15	Two numbers added together equal 1. The two numbers multiplied together equal –30. What are the two numbers?

YEAR 9 HALF-YEARLY 2016   Student:_____

SECTION 1: STATISTICS   Teacher:_____

MULTIPLE CHOICE: CIRCLE THE CORRECT ANSWER   20 MARKS
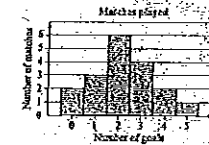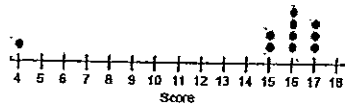
1. What is the median of 12, 20, 9, 4, 16, 11 and 13?

$4, 9, 11, (12), 13, 16, 20$

   A. 4   B. 11   (C.) 12   D. 13 ✓

2. The mean of five scores is 4. What is the missing score if four of the scores are 2, 5, 5 and 7?

   (A.)   B. 2   C. 4   D. 5 ✓

3. From this frequency histogram, the total number of matches played was:

   A. 17   B. 5   C. 6   (D) 18 ✓

4. The interquartile range of the scores $5, (5, 6) 7, (7) 7, (8, 8), 9$ is:

$8 - 5.5 = 2.5$

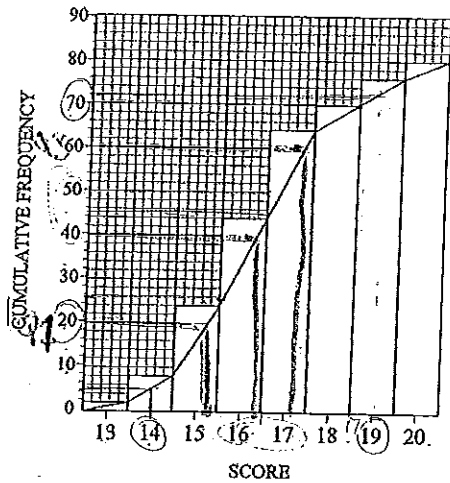   A. 2   (B.) 2.5   C. 3   D. 4 ✓

4

5. If the outlier is removed, which of these statements are true.

Score

A. The mean will not change   B. The median will change

C. The mode will not change   D. The range will not change ✓

SHORT/EXTENDED ANSWER: SHOW WORKING

6. Use the cumulative frequency histogram and polygon provided to determine the interquartile range of the data.

SCORE

$17 - 15 = 2$

2

7.

Class	Class Centre	Frequency	Cumulative Frequency
1 - 5	3	11	11
6 – 10	8	18	29
11 – 15	13	22	51
16 – 20	18	10	61
21 – 25	23	7	68

a. Complete the *class centre* and *cumulative frequency* columns in the frequency distribution table above.

②

b. Determine the median class.
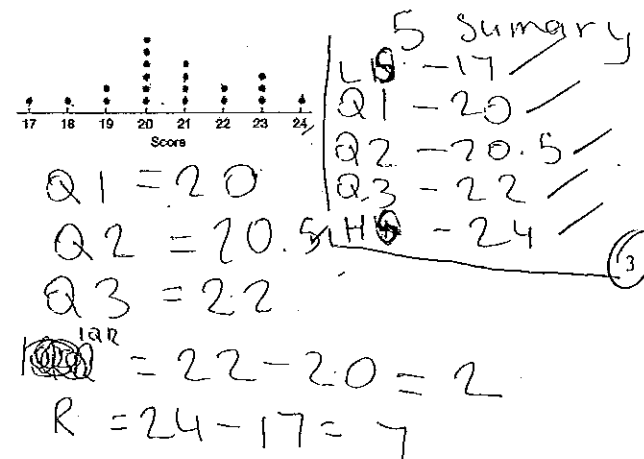
$11-15$

✓

①

8. a. Use the dot plot to find the 5 number summary for the scores.
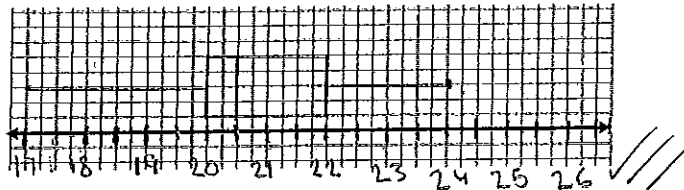

Score

L·S
Q1
Q2
Q3
H

$Q1 = 20$
$Q2 = 20.5$
$Q3 = 22$

IQR $= 22-20 = 2$
$R = 24-17 = 7$

5 sumary
LS – 17
Q1 – 20
Q2 – 20.5
Q3 – 22
H – 24

③

6

b. Use the 5 number summary to construct a box and whisker plot for the scores.

③

c. Use the box and whisker plot to find the Interquartile range.

$$22 - 20 = 2$$

// ②

d. What percentage of the scores lie between 20 and 22?

$$50\%$$

✓ ✗ ①

e. What is the median?

$$20.5$$

✓

①

SECTION 2: Indices & Probability   Teacher:_____

MULTIPLE CHOICE: CIRCLE THE CORRECT ANSWER   14 MARKS

1. If one letter is selected at random from those making up the word EXCITEMENT, what is the probability that it is *not* a vowel (I or E)?

A. $\dfrac{1}{5}$ B. $\dfrac{2}{5}$ C. $\dfrac{1}{2}$ Ⓓ. $\dfrac{3}{5}$ ✓

2. If E is the event 'a number less than 3' when a 6-sided die is rolled, then the complement of this event is:

A. $\{1, 2, 3\}$ Ⓑ. $\{3, 4, 5, 6\}$ C. $\{5, 6\}$ D. $\{1, 2, 3, 4\}$ ✓

4. $(5a^3b^2)^2$ simplifies to:

A. $10a^6b^4$ Ⓑ. $25a^6b^4$ C. $10a^5b^4$ D. $25a^5b^4$ ✓

5. $2^3 \times 2^5$ simplifies to:

A. 2^2 Ⓑ. 2^8 C. 2^{15} D. 4^8 ✓

④

SHORT/EXTENDED ANSWER: SHOW WORKING

6. A card is chosen from a normal playing pack. Determine the probability that the card is:

a. The jack of hearts

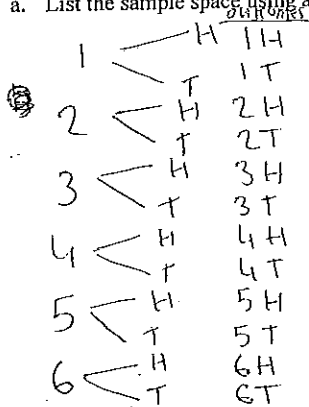$$\frac{1}{52} \checkmark$$

(1)

b. A heart and a picture card

$$\frac{3}{52} \checkmark$$

(1)

7. A coin is tossed and a dice is rolled.

a. List the sample space using a tree diagram.

$$
\begin{array}{lll}
1 & <\begin{array}{l} H \\ T \end{array} & \begin{array}{l} 1H \\ 1T \end{array} \\
2 & <\begin{array}{l} H \\ T \end{array} & \begin{array}{l} 2H \\ 2T \end{array} \\
3 & <\begin{array}{l} H \\ T \end{array} & \begin{array}{l} 3H \\ 3T \end{array} \\
4 & <\begin{array}{l} H \\ T \end{array} & \begin{array}{l} 4H \\ 4T \end{array} \\
5 & <\begin{array}{l} H \\ T \end{array} & \begin{array}{l} 5H \\ 5T \end{array} \\
6 & <\begin{array}{l} H \\ T \end{array} & \begin{array}{l} 6H \\ 6T \end{array}
\end{array}
$$

$\checkmark\checkmark$

(2)

b. What is the probability of getting a 6 and a tail?

$$\frac{1}{12} \checkmark$$

(1)

8. Simplify $\dfrac{14a^4}{21a^5} = \dfrac{2a^4}{3} \checkmark$

(2)

9. Simplify $3y^0 + (3y)^0$ $3 \times 1 + 1 = 4$ $\checkmark$

(1)

10. Write $36q^{-4}$ without the negative index.

$$\frac{36}{q^4} \checkmark$$

(1)

Student: _____

Teacher: _____

MULTIPLE CHOICE: CIRCLE THE CORRECT ANSWER   14 MARKS

1. A mixed touch football has 4 boys and 6 girls. The simplest ratio of girls to boys is:

$6 : 4$

   A. $2:3$ B. $4:6$ C. $6:4$ (D.) $3:2$ ✓

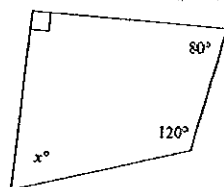2. When $650 is increased by 10% then the result decreased by 10% the final amount is:

$650 \times 1 \cdot 1 \times 0 \cdot 9$

   A. $60.50   B. $600   C. $650   (D.) $643.50 ✓

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3. What is the value of x?

NOT TO SCALE

(diagram of quadrilateral with angles: right angle, 80°, 120°, x°)

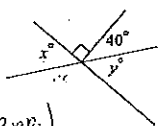   A. 40   B. 50   (C.) 70   D. 90 ✓

---

4. What is the value of $x + y$ from the diagram?

$90 + 40 = 130$
$130 \times 2 = 260$
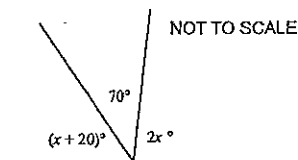$360 - 260 = 100$
$x + y = 100$ (vert. opp.)

   A. 90   (B.) 100   C. 180   D. 230 ✓

SHORT/EXTENDED ANSWER: SHOW WORKING
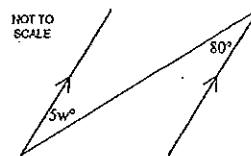
5. Find the value of x.

(diagram NOT TO SCALE with angles 70°, $(x+20)°$, $2x°$)

$70 + x + 20 + 2x = 180$
$3x + 90 = 180$
$\dfrac{3x}{3} = \dfrac{90}{3}$
$x = 30°$ ✓✓   2

---

6. For the diagram shown, determine the value of w. Give a reason for your answer.

(diagram NOT TO SCALE, angles $5w°$ and $80°$)
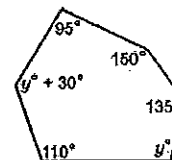
$\dfrac{5w}{5} = \dfrac{80}{5}$ (Alt. $\angle s$)
in parallel lines
$w = 16$ ✓   2

---

7. Find the value of y in the following polygon.

(polygon with angles 95°, 150°, 135°, 110°, $y°+30°$, $y°$)

$(n-2) \times 180$
$(6-2) \times 180 = 720$
$720 - (95 + 150 + 135 + 110 + 30) = 2y$
$\dfrac{2y}{2} = \dfrac{200}{2}$ $y = 100$ ✓✓   2

---

8. The exterior angle of a regular polygon is $18°$. How many sides has it? does it have?

$360 \div 18 = 20$ ✓   1

(4)   (6)

9. Write 0.617 as a fraction.

$0.61777777\ldots$

$100x = 61.77777\ldots$

$1000x = 617.77777\ldots$

$\dfrac{900x}{900} = \dfrac{556}{900}$

$x = \dfrac{139}{225}$ ✓✓

10. Complete the equivalent rate:

15m/s = [54] km/hr ✓

$15\text{m/s} \longrightarrow \text{km/hr}$

$15 \times 60 \times 60 = 54000 \text{m/hr}$

$\dfrac{54000}{1000} = 54 \text{km/hr}$

2

1

③

Write ANSWER ONLY in the Answer Column. Show working in the Question column.

#	Question	Answer
1	Simplify $17\,000 \times 200 =$ $\begin{array}{r}17\\ \times\ 2\\\hline 34\end{array}$ 3400000	3400000 ✓
2	Increase \$75 by 10%	\$82.50 ✓
3	The diameter of a microscopic particle is 0.000 072 metres. Write the number in scientific notation.	7.2×10^{-5} ✓
4	Simplify the ratio 32:48 $8:12$ $2:3$	$2:3$ ✓
5	You are making your own dressing for a salad. Here is a recipe for 100 millilitres (mL) of dressing.	90mL

Salad oil:	60 mL
Vinegar:	30 mL
Soy sauce:	10 mL

#	Question	Answer
	How many millilitres (mL) of salad oil do you need to make 150 mL of this dressing? $\begin{array}{r}90\\+\ 45\\+\ 15\end{array}$	✓
6	Write an algebraic expression for : "add twice *a* to *b* and divide the result by 5"	$\dfrac{2a+b}{5}$ ✓
7	Simplify: $5^0 + 7$ $5^0 = 1 + 7 = 8$	8 ✓
8	A coin is tossed 3 times. There are 8 possible outcomes. What is the probability of getting 2 tails and 1 head in any order? HTT HHT HHH TTT THH THT ·HHH ·HTT ✓ ·HHT ·HTH ·TTT ·THH ·TTH ✓	$\dfrac{3}{8}$ ✓

7.5
× 1.1
75
75'0
825

8

9	In a netball competition, each of the 8 teams must play each of the other 7 teams *once*. How many games must be played?	56 games. must be played
	$$\frac{8 \times 7}{2} = \frac{56}{2} = 28$$	
10	Arrange the numbers below in ascending order. $19, 33\frac{1}{3}\%, \frac{2}{3}, 1, 19\%$	$19\%, 33\frac{1}{3}\%, \frac{2}{3},$ $1, 19$ ✓
11	When $t = 4$ and $w = -4$, what is the value of $t^2 + w^2$? $4 \times 4 = 16, -4 \times -4 = 16$	$16 + 16 = 32$ ✓
12	Find the probability of rolling a 3 on a standard six – sided die? $P(3) = \frac{1}{6}$	$\frac{1}{6}$ ✓
13	The area of a rectangle is 98 cm^2. ████████ 7cm $7\overline{)98}$ $\begin{array}{r}14\\ \times 7\\ \hline 98\end{array}$ What is the length of the rectangle, if the width is 7cm?	$14cm$ ✓
14	A tin contains 15 green, 10 red, 7 black and 18 white jelly beans. Without looking, Jen takes one jelly bean from the tin. What is the probability that the jelly bean is red? $25 + 7 = 32 + 18 = 50$ $$\frac{10}{50} = \frac{1}{5}$$	$\frac{1}{5}$ ✓
15	Two numbers added together equal 1. The two numbers multiplied together equal –30. What are the two numbers? $-5 + 6 = 1$ $-5 \times 6 = -30$	-5 and 6