INDEX NUMBER: _____

JASPER WILLIAMS HIGH SCHOOL

YEAR 12 ANNUAL EXAMINATION 2020

MATHEMATICS

ANSWER BOOKLET

HAND IN THIS ANSWER BOOKLET TO THE SUPERVISOR BEFORE YOU LEAVE THE EXAMINATION ROOM

MARK
GAINED:

STRAND 1 **BASIC MATHEMATICS** **[12 marks]**

1. _____ **(1 mark)**

2. _____ **(1 mark)**

3. _____ **(1 mark)**

4. $\frac{7}{3-\sqrt{2}}$

_____ **(2 marks)**

5. $3^{x+1} = 9$

$x =$ _____ **(1½ marks)**

6. $\frac{4^{5x}}{2^{x}}$

_____

(1½ mark)

7.

Total amount paid: _____

(1 mark)

8. (a)

Identity element: _____

(1 mark)

8. (b)

Inverse of 1: _____

(1 mark)

8. (c)

_____

(1 mark)

12

STRAND 2 **ALGEBRA** **[18 marks]**

1._____ **(1 mark)** 2._____ **(1 mark)** 3._____ **(1 mark)** 4._____ **(1 mark)** 5._____ **(1 mark)**

6. $x^2 - 2x - 4 = 0$

$x =$ _____

(2 marks)

7. (a)

Discriminant: _____

(1 mark)

7. (b)

Nature of roots: _____

(1 mark)

8. $\frac{4x}{y} - \frac{x}{3} \div \frac{y}{3}$

_____

(2 marks)

9. $\frac{x+1}{3} = \frac{2x+6}{8}$

$x =$ _____

(2 marks)

10.

Sum to infinity = _____

(1 mark)

11. $f(x) = x^3 - 5x^2 - 2x + 24$

Factors: _____

(2 marks)

12. (a)

6^{th} term = _____

(1 mark)

12. (b)

Sum of first 10 terms = _____

(1 mark)

18

STRAND 3 **GRAPHS** **[12 marks]**

1. _____ **(1 mark)**

2. _____ **(1 mark)**

3. _____ **(1 mark)**

4. _____ **(1 mark)**

5. $y = x + 5$ $x^2 + y^2 = 25$

x – coordinates: {_____, _____}
(2 marks)

6. (a)

x-intercept: _____ **(½ mark)** *y*-intercept: _____ **(½ mark)**

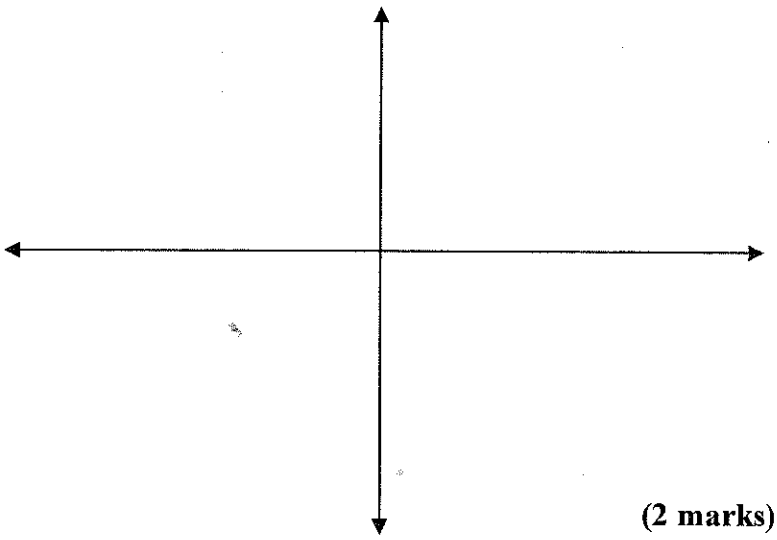
6. (b)

VA: _____ **(½ mark)** HA: _____ **(½ mark)**

6. (c)

Equation: _____ **(2 marks)**

7. $y = (x + 2)(x - 1)(x - 3)$



(2 marks)

12

STRAND 4 **COORDINATE GEOMETRY** **[7 marks]**

1._____ **(1 mark)**

2._____ **(1 mark)**

3. (a)

Length of AB: _____ **(1 mark)**

3. (b)

Gradient of AB: _____ **(1 mark)**

3. (c)

Gradient of BC: _____

(1 mark)

4.

(2 marks)

7

STRAND 5 **TRIGONOMETRY** **[10 marks]**

1. _____ **(1 mark)**

2. _____ **(1 mark)**

3. (a)

Length of arc AB: _____ **(1 mark)**

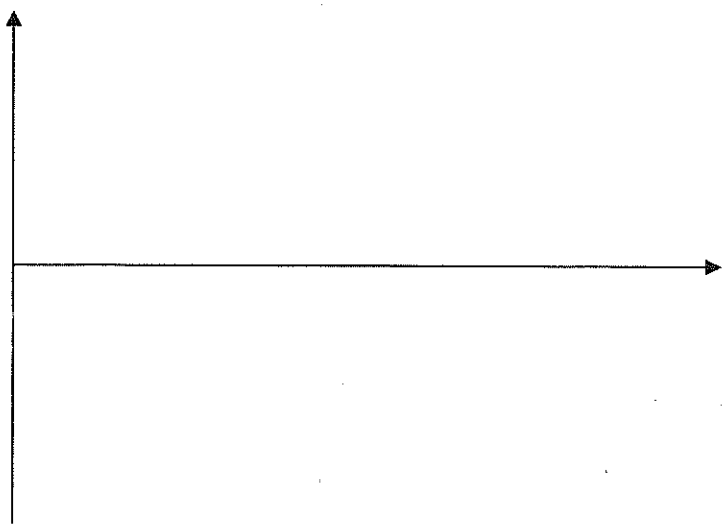
3. (b)

Area of sector: _____ **(1 mark)**

4.

Value of side L: _____ **(2 marks)**

5.



(2 marks)

6. $\sqrt{3}\tan\theta = 1 \quad \text{for} \quad 0° \leq \theta \leq 360°$

$\theta = \{\_\_\_\_\_, \_\_\_\_\_\}$

(2 marks)

10

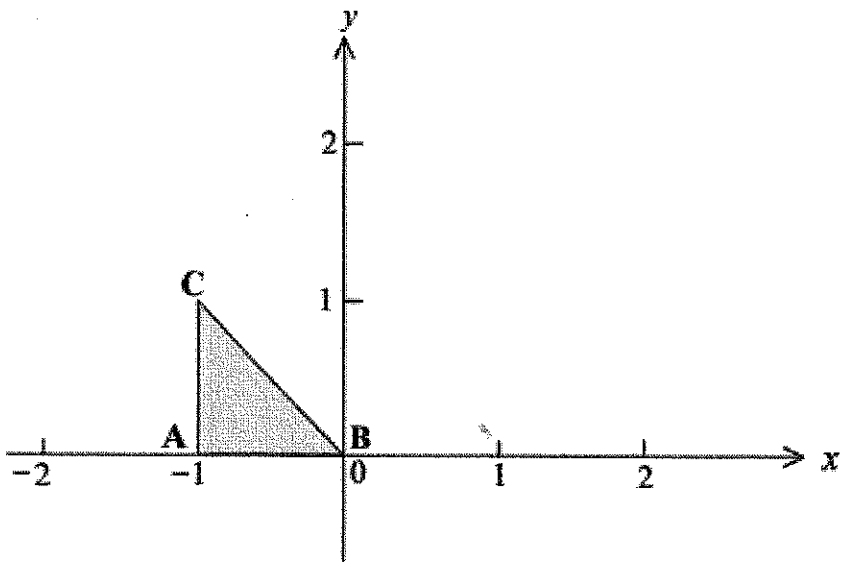
STRAND 6 **MATRICES AND TRANSFORMATION** **[7 marks]**

1. _____
(1 mark)

2. (a)

A' = (____, ____) C'= (____, ____)
(2 marks)

2. (b)



(2 marks)

2. (c)

Transformation: _____

(1 mark)

2. (d)

Invariant property: _____ **(1 mark)**

7

STRAND 7 **STATISTICS** **[6 marks]**

1. _____ **(1 mark)**

2. _____ **(1 mark)**

3. (a)

Mean score: _____ **(1 mark)**

3. (b)

x	f	fx	$(x-\bar{x})^2$	$f(x-\bar{x})^2$
1	1	1	4	4
2	4	8	1	4
3	9	27		
4	6	24		
Total	**20**	**60**		**14**

(2 marks)

3. (c)

_____ **(1 mark)**

6

STRAND 8 **PROBABILITY** **[10 marks]**

1._____
(1 mark)

2._____
(1 mark)

3.

Probability of different colours: _____
(2 marks)

4. (a)

Number of students surveyed: _____
(1 mark)

4. (b)

Probability of student taking Agriculture: _____
(1 mark)

5. (a)

(3 marks)

5. (b)

(1 mark)

10

STRAND 9 **CALCULUS** **[18 marks]**

1. _____ **(1 mark)**

2. _____ **(1 mark)**

3.

Area of the shaded region: _____

(3 marks)

4. (a) $y = x^3 + 3x^2 - 9x + 2.$

$\frac{dy}{dx} =$ _____

(2 marks)

4. (b)

Coordinates of the turning points: {(____, ____), (____, ____)}

(3 marks)

5. $\frac{dy}{dx} = x^2 - 9$

Equation of the curve: _____

(3 marks)

6. (a)

Expression for height: $y =$ _____

(1 mark)

6. (b)

Volume of the box: $V =$ _____

(1 mark)

6. (c)

$x =$ _____

(3 marks)

THE END

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