



NORWEST
CHRISTIAN COLLEGE
STRENGTH OF PURPOSE

Student Name: _____

Solutions

Year 10 MATHEMATICS 5.1/5.2 2022

TASK 1

General Instructions

- No reading time given
- Working time – 55 minutes
- Show all necessary working / units
- Board approved calculators are allowed
- Exam guidelines
 - ✓ Use black pen for your working
 - ✓ Use a pencil and ruler for diagrams
 - ✓ Marks may be lost for poorly organised written work.

Total Marks – 40

Section 1 5.1 – 20 marks

Allow 25 mins

Section 2 5.2 – 20 marks

Allow 30 mins

Examiner's use only		B.Su, D.Luo, E.Shing	
Question	Indices and Algebra	Equations	Total
Section 1 (5.1)			/20
1,2,5, 6-10	/11		
3,4, 11-13		/9	
Section 2 (5.2)			/20
1,2,5	/3		
3,4, 6-9		/17	
Total	/14	/26	/40

Section 1 – 5.1 (20 marks)

Attempt Questions 1 to 13

Allow approximately 25 minutes for this section

Multiple Choice Questions

1. The coefficient of x in $4y + 5x + 7$ is:

~~A. 3~~
C. 5

B. -4

D. 7

2. Simplify $7a + 3b - 2a$

A. $2ab$

B. $8a + b$

C. $5a + 3b$

D. $7a + 3b$

3. If $M = 5$, the value of $4M - 3$ is equal to:

A. 2

B. 5

C. 17

D. 20

4. The solution to $y - 3 = 5$ is:

A. 15

B. 8

C. 5

D. 2

5. $3a^2 \times 2a^3$ can be written as:

A. $6a$

B. $5a$

C. a^6

D. $6a^5$

Short Answer Questions

Answer the questions in the spaces provided. Your responses should include relevant mathematical reasoning and/or calculations.

Marks **CANNOT** be awarded for poorly organised written work.

6. Find the value of the following and correct to 3 significant figures.

$$5.9 \times 6.2$$

(1 mark)

$$5.9 \times 6.2 = 36.58 = 36.6 \text{ (to 3 sig. fig.)} \quad 1\text{m}$$

7. Write the number below in scientific notation correct to 3 significant figures. (2 marks)

$$2164000$$

$$2.164 \times 10^6 = 2.16 \times 10^6 \text{ (3 sig. fig.)}$$

1m (m)

8. Apply index laws to simplify the following algebraic expressions.

a. $x^{10} \div x^4$

(1 mark)

$$x^6$$

b. $(x^2)^3$

(1 mark)

$$x^6$$

9. Find the exact value of x^0 .

(1 mark)

$$1$$

10. Expand the following:

a. $3(x + 1)$

(1 mark)

$3x + 3$

b. $5(2 - y)$

(1 mark)

$10x - 5y$

11. Find the answers of the following equations:

a. $\frac{5x}{2} = 10$

(2 marks)

$5x = 20$ 1m

$x = 4$ 1m

b. $5x - 3 = 12$

(2 marks)

$5x = 12 + 3 = 15$ 1m

$x = 3$ 1m

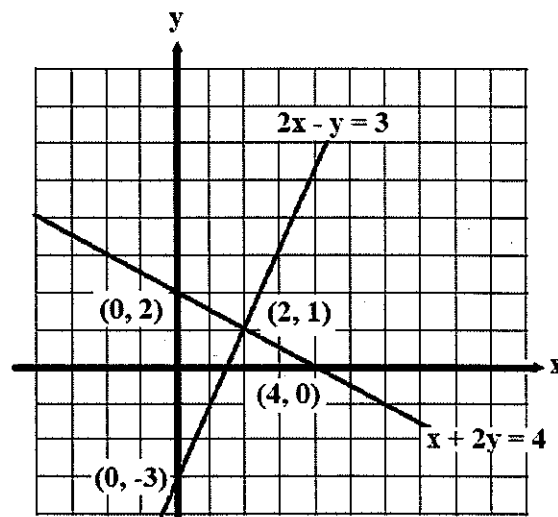
12. From the graph below, find the point of intersection of the 2 lines:

(1 mark)

$$2x - y = 3 \text{ and}$$

$$x + 2y = 4$$

$(2, 1)$



13. If $F = ma$ and $m = 10$ and $a = 5$, find the value of F :

(2 marks)

$F = (10)(5)$
 $= 50$

Section 2 – 5.2 (20 marks)

Attempt Questions 1 to 10.

Allow approximately 25 minutes for this section

Multiple Choice Questions

1. Simplify $\frac{14x^5}{2x^3}$:

A. $7x$

C. x^{14}

☒ B. $7x^2$

D. x^2

2. 2×4^{-3} expressed with a positive index is:

A. 24

☒ C. $\frac{1}{2 \times 4^3}$

B. 12^3

D. $\frac{1}{2 \times 4^3}$

3. If $2(x - 5) = 12$, x is equal to:

A. 12

☒ C. 10

☒ B. 11

D. 1

4. If 4 is subtracted from $2x$, the result is 12, which of the following is correct?

A. $4 + 2x = 12$

C. $x - 4 = 12$

B. $4 - x = 12$

☒ D. $2x - 4 = 12$

5. $(-a^3b^2)^3$ is equivalent to:

☒ A. $-a^9b^6$

C. $-a^6b^5$

B. a^9b^6

D. a^6b^5

Short Answer Questions

Answer the questions in the spaces provided. Your responses should include relevant mathematical reasoning and/or calculations.

Marks **CANNOT** be awarded for poorly organised written work.

6. Solve for x :

(a) $5x - 29 = 11$

(2 marks)

$$5x = 29 + 11 = 40$$

1m

$$x = 8$$

1m

(b) $\frac{5m+6}{3} = 12$

(3 marks)

$$5m + 6 = 12 \times 3 = 36$$

1m

$$5m = 30$$

1m

$$m = 6$$

1m

7. The cost (in dollars) of a taxi is $C = 4 + 1.2d$, where d is the distance travelled in kilometres.

a. What is the cost of a 15 km trip?

(1 mark)

$$C = 4 + 1.2 \times 15 = \$22$$

1m

a. How many kilometres can be travelled for \$40?

(2 marks)

$$40 = 4 + 1.2d$$

$$1.2d = 36$$

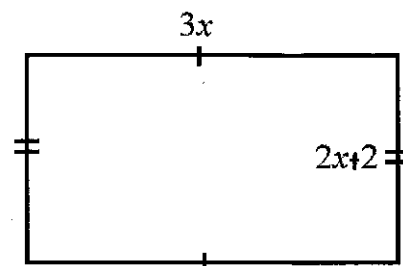
$$d = 30 \text{ km}$$

} 1m

1m

8. The dimensions of a rectangle room are measured in metres (m).

The length and the width of the room are $3x$ and $2x + 2$.



- a. If P is the perimeter of the room, show that the simplified expression for P is:

$$P = 10x + 4$$

$$P = \overbrace{3x + 3x}^{1m} + \overbrace{2x + 2 + 2x + 2}^{1m}$$

$$= 10x + 4$$

(2 marks)

- b. If $P = 34$ m, find the value of x in metre.

(1 mark)

$$34 = 10x + 4$$

$$x = 4 \text{ m}$$