



Centre Number	Candidate Number

MINISTRY OF EDUCATION AND HUMAN RESOURCE DEVELOPMENT

SOLOMON ISLANDS SCHOOL CERTIFICATE

2018

MATHEMATICS

WEDNESDAY 7th NOVEMBER 9.00 AM

**TIME: 3 Hours plus
10 minutes reading time**

<u>SECTION</u>	<u>CONTENT</u>	<u>MARK</u>
A	Multiple Choice Questions	20
B	Short Answer Questions	20
C	Long Answer Questions	<u>60</u>
	TOTAL	<u>100</u>

INSTRUCTIONS TO CANDIDATES

1. Do not open this Booklet until you are told to do so.
2. Make sure both your Centre Number and Candidate Number are written in the spaces provided at the top right hand corner and also on the back flap at the back of this booklet.
3. Before you answer the questions, read through the instructions carefully.
4. Answer all questions and do all the working out on the spaces provided.
5. Do NOT use correction fluid.
6. Mobile phones are NOT allowed in the Examination room.
7. You are allowed to use a Scientific Calculator and a ruler.

**YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE
EXAMINATION.**

THIS BOOKLET CONTAINS 26 NUMBERED PAGES.

SECTION A: MULTIPLE CHOICE QUESTIONS

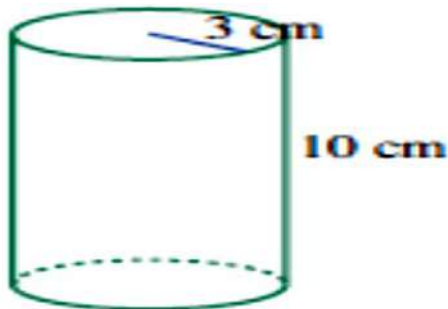
(20 MARKS)

WRITE THE LETTER OF THE MOST CORRECT ANSWER IN THE BOX PROVIDED IN THE BACK FLAP. EACH QUESTION (1- 20) IS WORTH ONE (1) MARK.

1. $(a^3b^2)^2$ is equal to;

- A. a^5b^4
- B. a^6b^4
- C. a^6b^4
- D. a^9b^4

2. The surface area of the cylinder shown is;



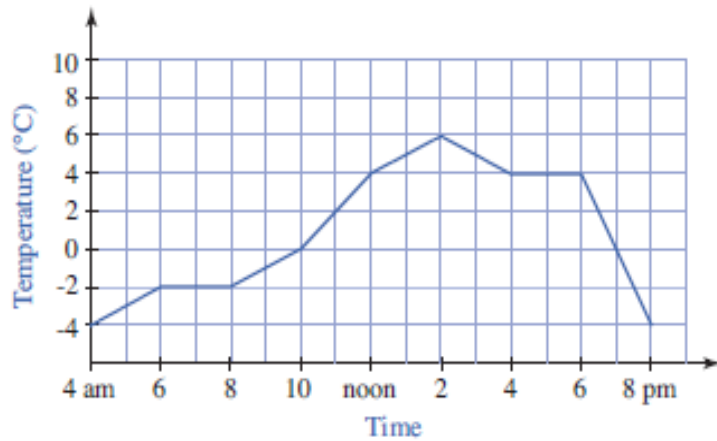
- A. $13\pi \text{ cm}^2$
- B. $26\pi \text{ cm}^2$
- C. $39\pi \text{ cm}^2$
- D. $78\pi \text{ cm}^2$

3. A container of capacity 1.5 litres has a volume of;

- A. 1.5 cm^3
- B. 15 cm^3
- C. 150 cm^3
- D. 1500 cm^3

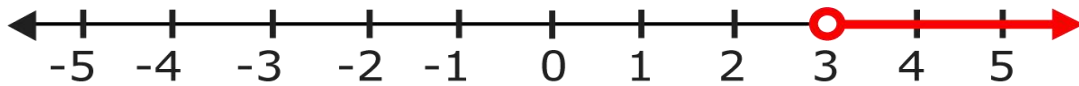
4. A new truck is estimated to lose 20 percent of its value each year based upon the price at the beginning of that year. If a company purchased a truck for \$72 000 at January 1st 2018, what will be its value after it has been used for a year?
- A. 14 400
B. 57 600
C. 72 000
D. 86 400
5. The perimeter of a triangle is 23cm. One side is twice the length of the base. The third side is 3cm longer than the base. An equation relating all 3 sides with the perimeter is;
- A. $2b + 3 = 23$
B. $3b + 3 = 23$
C. $4b + 3 = 23$
D. $5b + 3 = 23$
6. The gradient and y-intercept of the straight line $3x + 2y - 5 = 0$ is;
- A. Gradient = 3 and y-intercept = -5
B. Gradient = $\frac{3}{2}$ and y-intercept = $-\frac{5}{2}$
C. Gradient = -3 and y-intercept = 5
D. Gradient = $-\frac{3}{2}$ and y-intercept = $\frac{5}{2}$
7. If you factorize $3x(x + 2) - 4(x + 2)$ you get;
- A. $3x - 4(x + 2)$
B. $(3x + 4)(x + 2)$
C. $(3x - 4)(x - 2)$
D. $(3x - 4)(x + 2)$

8. Temperature was recorded on a 2 – hourly basis and the temperature – time graph was drawn. At what time was the temperature decreasing the fastest?



- A. Between 6am and 8am
B. Between 8am to 2pm
C. Between 2pm to 6pm
D. Between 6pm to 8pm
9. Which of these is the basic formula for a cubic function?
- A. $y = x^2$
B. $y = x^3$
C. $x^2 + y^2 = r^2$
D. $y = \frac{1}{x}$

Use this diagram to answer Question 10.



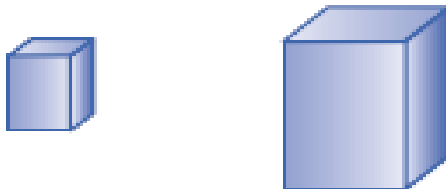
10. Which of the following best describes the RED line above?

- A. $x > 3$
- B. $x < 3$
- C. $x \leq 3$
- D. $x \geq 3$

11. By factorizing the expression $x^2 - 3x + 2$ we get;

- A. $(x + 1)(x + 2)$
- B. $(x + 1)(x - 2)$
- C. $(x - 1)(x + 2)$
- D. $(x - 1)(x - 2)$

12. These two cuboids are similar. The scale factor between their area is 4: 9, therefore, the ratio of their volumes will be;

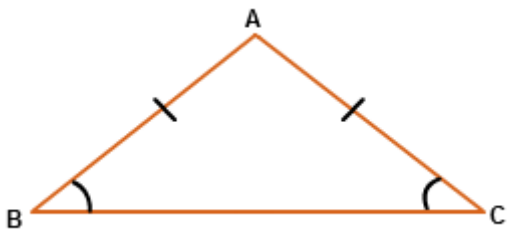


- A. 2:3
- B. 4:9
- C. 8:27
- D. 16:27

13. Rewrite $U = \begin{pmatrix} -4 \\ 2 \end{pmatrix}$, $V = \begin{pmatrix} 2 \\ 5 \end{pmatrix}$ and $W = \begin{pmatrix} 3 \\ 1 \end{pmatrix}$. Expressing $\frac{1}{2}U - V + 2W$ as a single vector yields;

- A. $\begin{pmatrix} 2 \\ -2 \end{pmatrix}$
- B. $\begin{pmatrix} -2 \\ 2 \end{pmatrix}$
- C. $\begin{pmatrix} 6 \\ -2 \end{pmatrix}$
- D. $\begin{pmatrix} 2 \\ 2 \end{pmatrix}$

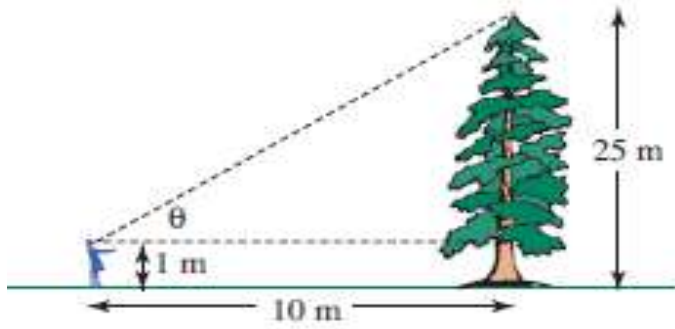
Use the diagram below to answer question 14



14. For an isosceles triangle as the one shown above. Which Statement is **NOT TRUE**?

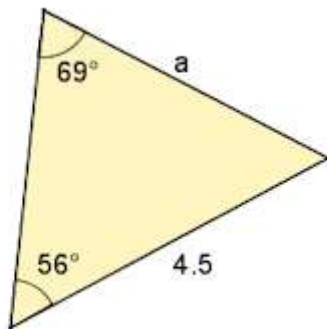
- A. $\text{Angle } B = \text{Angle } C$
- B. $\text{Length } AC = \text{Length } AB$
- C. $\text{Angle } A = \frac{(\text{Angle } B + \text{Angle } C)}{2}$
- D. $\text{Angle } A = 180^\circ - (\text{Angle } B + \text{Angle } C)$

15. The angle of elevation θ in the diagram below is;



- A. 22.62°
- B. 24.62°
- C. 65.38°
- D. 67.38°

16. The value of length ' a ' in the diagram below is;



- A. 3.72 Units
- B. 4.00 Units
- C. 5.07 Units
- D. 6.12 Units

17. The number of DVDs hired over the course of a year by a sample of 30 customers was recorded in the frequency distribution table below.

No. of DVDs	Tally	Frequency
21-30		2
31- 40		5
41- 50		6
51- 60		7
61- 70		6
71- 80		4
	Total	30

The **modal** class is;

- A. 21 – 30
 - B. 41 – 50
 - C. 51 – 60
 - D. 71 – 80
18. Which is **NOT** true? The probability that a coin land heads up is;
- A. 2 out of 1
 - B. $\frac{1}{2}$
 - C. 50%
 - D. 1 out of 2

19. There are 5 consecutive odd numbers a, b, c, d and e . The **mean** for these 5 numbers is;

A. $a + \frac{e}{2}$

B. $b + \frac{d}{2}$

C. $\frac{(b + d)}{2}$

D. $\frac{(a + d)}{2}$

20. TWO (2) die are thrown together and the number that shows on each one are added. What is the probability of **NOT** getting a sum of 7?

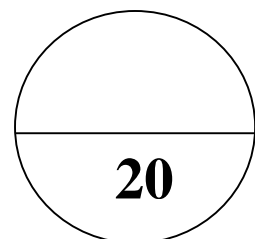
A. $\frac{1}{6}$

B. $\frac{1}{2}$

C. $\frac{2}{3}$

D. $\frac{5}{6}$

Total Marks for Section A:



SECTION B: SHORT ANSWER QUESTIONS

(20 MARKS)

WRITE THE ANSWERS FOR EACH QUESTION IN THE SPACES PROVIDED. IT IS IMPORTANT THAT YOU SHOW ALL YOUR WORKING OUT AS SOME MARKS ARE AWARDED FOR APPROPRIATE METHODS AND PARTIALLY CORRECT ANSWERS.

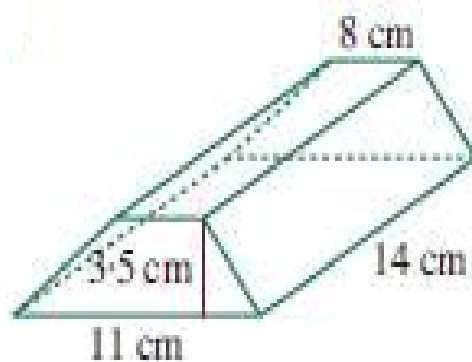
21. Write the **surd** in its simplest form. Answer should be in surd form with no decimals.

$$8\sqrt{128} - 7\sqrt{50} + \sqrt{98}$$

Answer: _____

(2 marks)

22. Calculate the **volume** of the solid below. Note that 3.5 cm is the height of the cross section.



Answer: _____

(2 marks)

23. A mini bus can carry 12 passengers and a car can carry 4 passengers. There are 44 passengers and they need 7 vehicles for the tour.

- a) If m is the number of mini buses and c is the number of cars, write TWO (2) simultaneous equations from this information.

Answer: _____
(2 marks)

- b) Hence, find the number of mini buses and the number of cars.

No. of mini buses _____
(1 mark)

No. of cars _____
(1 mark)

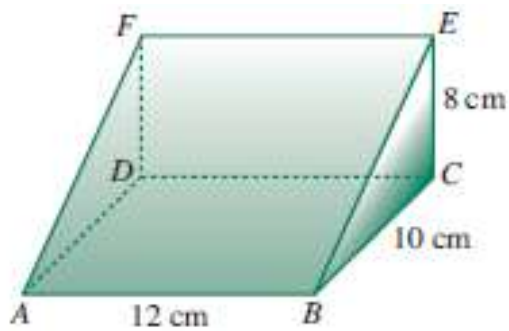
24. Express in **simplest** form. $\frac{x^2 - 8x + 15}{x^2 - 3x - 10} \times \frac{x^2 + 5x + 6}{x^2 - 6x + 9}$

Answer: _____
(2 marks)

25. Sketch the graph of $y = \frac{1}{x} - 2$ and show asymptotes and intercepts where necessary.

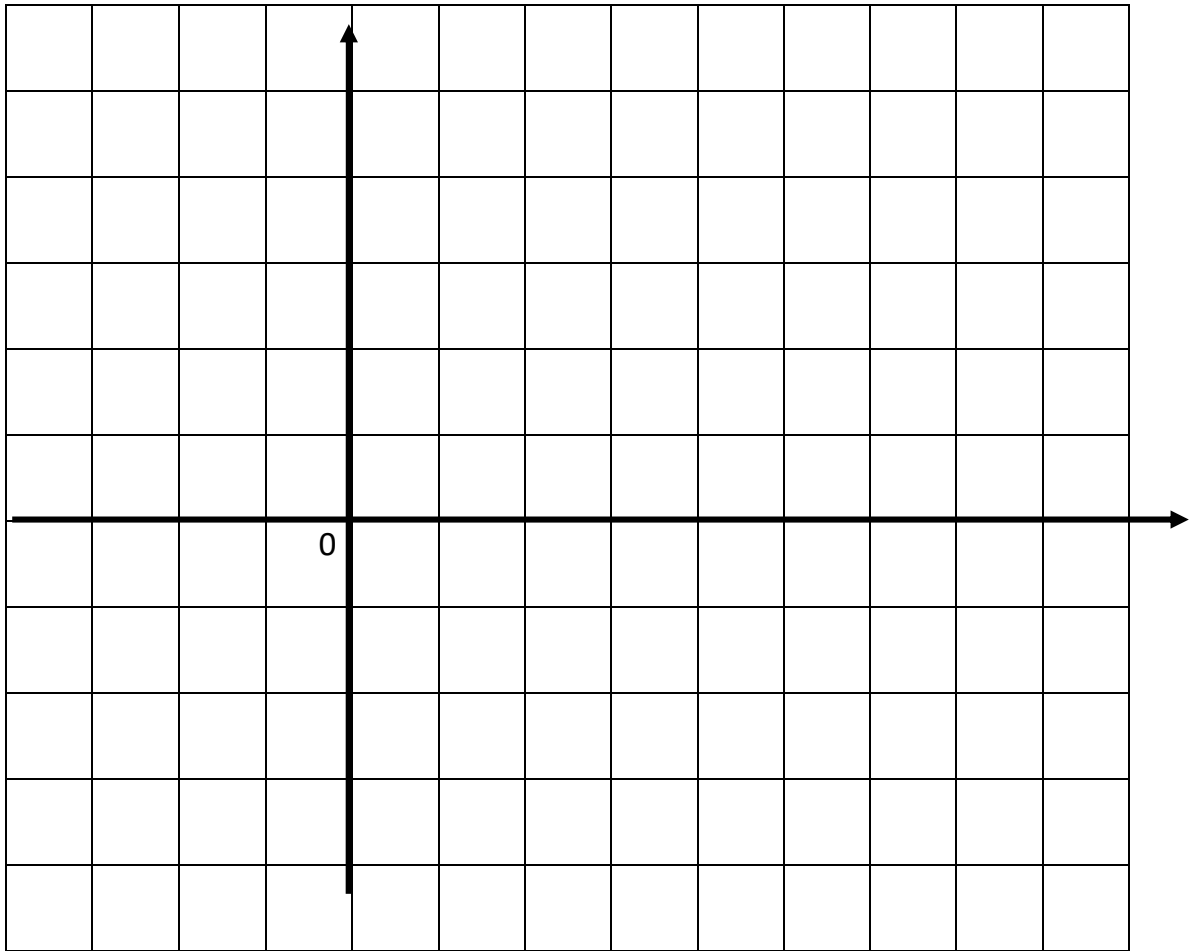
(2 marks)

26. A rectangular-base wedge is shown below. Find the angle the line AE makes with the plane ABCD.



Answer: _____
(2 marks)

27. a) Sketch the graph of $y = \sin 2x$ over the interval between 0° to 360° .



(2 marks)

28. The students at Ranadi Community High School were surveyed regarding their opinion about wearing school uniform. The results are displayed in the table below.

	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12
<i>In Favour</i>	60	55	40	45	25	15
<i>Against</i>	20	25	35	45	55	60
<i>Not Sure</i>	10	10	10	5	5	0

- a) What is the probability that a Year 7 student is **in favour** of school uniform?

Answer: _____
(1 mark)

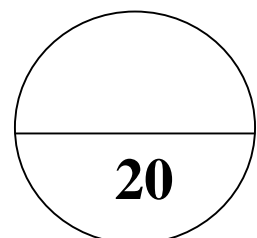
- b) What is the probability that a student selected at random in the school will **not be sure** about this issue?

Answer: _____
(1 mark)

- c) How many percentage of years 11 and 12 combined are **in support** of wearing the school uniform?

Answer: _____
(2 marks)

Total Marks for Section B:



SECTION C:**LONG ANSWER QUESTIONS****(60 MARKS)**

WRITE THE ANSWERS TO EACH QUESTION IN THE SPACES PROVIDED. IT IS IMPORTANT THAT YOU SHOW ALL YOUR WORKING OUT AS SOME MARKS ARE AWARDED FOR APPROPRIATE METHODS AND PARTIALLY CORRECT ANSWERS.

29. Use the information given below to answer this question.

Formula for calculating the P.A.Y.E deduction is shown below;

Total Income multiply (x) Pay Period, subtract (-) Exemption \$7 800.00, subtract (-) the Rate, multiply (x) by Rate Percent (%), divide (÷) Pay Period.

Rate				Pay Period	
1 st	\$ 1.00		\$15,000.00 = (× 11%)	Weekly	52 PAY DAYS
2 nd	\$15,001.00		=(× 23% + \$1,650.00)	Fortnightly	26 PAY DAYS
3 rd	\$30,001.00		=(× 35% + \$5,100.00)	Bi-monthly	24 PAY DAYS
4 th	\$60,001.00		& ABOVE = (× 40% + \$15,600.00)	Monthly	12 PAY DAYS

Work out the following P.A.Y.E Tax deductions for the 2 workers below.

- a) Ezekiel Dexter earns a fortnight Salary of \$ 1 500 working as a training coordinator for life skills development.

Answer: _____

(2 marks)

- b) Boniface Karlos earns a monthly Salary of \$ 10 500 working as a consultant for Sol-Fish Yagayow.

Answer: _____
(2 marks)

30. On the grid below;

a) Draw the graph of $2y = -x - 3$



(2 marks)

b) Draw the graph of $y = 2x - 4$ on the same grid. (2 marks)

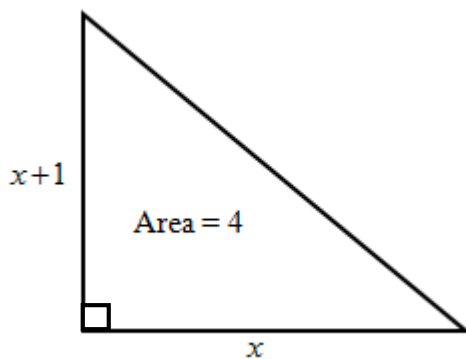
c) Shade the region bounded by the lines $2y \geq -x - 3$, $y \geq 2x - 4$ and the x -axis. (2 marks)

- d) From your graph on page 17, determine the point of intersection of the 2 lines and calculate the area of the shaded region.

Point of intersection: _____
(2 marks)

Area of Shaded region: _____
(2 marks)

31. Use the diagram below to answer the following questions (a, b and c).



- a) Write a **formulae** relating to the area and x .

Answer: _____
(1 mark)

b) Express the formulae in the form $ax^2 + bx + c = 0$

Answer: _____

(1 mark)

c) Use the quadratic formulae to find the values of x .

Answer: _____

(4 marks)

32. A corner kick is being taken by a Soccer Player. The equation of the trajectory of the ball is $h(t) = 5t - t^2$ where **h** is measured in meters and **t** in seconds.

Find the;

a) height the ball starts at.

Answer: _____

(1 mark)

b) maximum **height** reached.

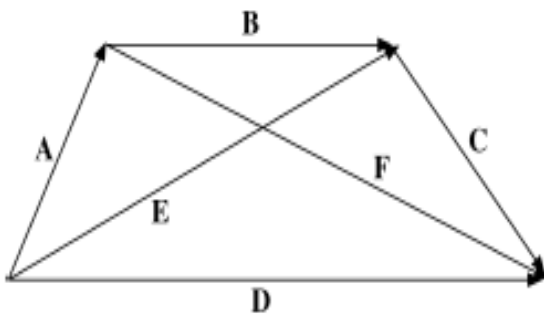
Answer: _____

(1 mark)

c) **time** it takes for the ball to return to its original height?

Answer: _____
(2 marks)

33. Given the diagram below. Express each of the following as an equivalent vector.



a) Vector A + Vector B = _____ (1 mark)

b) Vector A + Vector B + Vector C = _____ (1 mark)

c) Vector E + Vector C + - Vector F = _____ (1 mark)

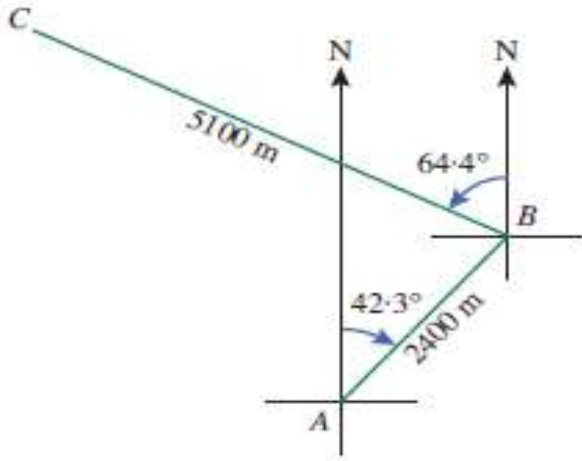
d) Vector E + -Vector B + - Vector A = _____ (1 mark)

e) Vector D + -Vector F + Vector B = _____ (1 mark)

f) State whether True or False;

Vector A + Vector F = Vector E + Vector C = _____ (1 mark)

34. Craigsman starts from Point A and travels according to the diagram below through Point B to Point C. How far should he covers if he travels directly from Point A to point C?



Answer: _____
(5 marks)

35. Given the following set of data below;

13 12 14 6 15 12 7 6 7 8

Find the;

- a) Median

Answer: _____
(2 marks)

- b) Upper Quartile

Answer: _____
(1 mark)

c) Lower Quartile.

Answer: _____
(1 mark)

d) The Inter – Quartile Range

Answer: _____
(1 mark)

e) Mean

Answer: _____
(1 mark)

f) (i) Complete the table below.

(4 marks)

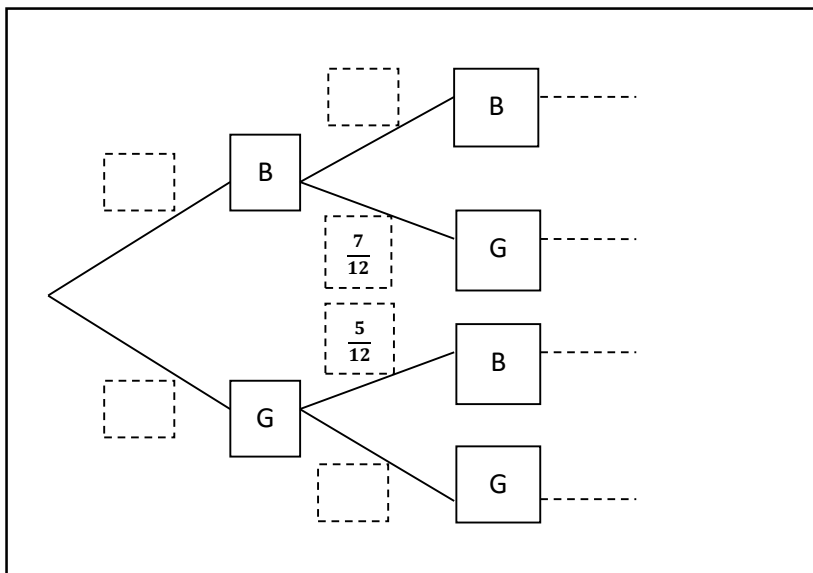
x	$(x - \bar{x})$	$(x - \bar{x})^2$
6		
6		
7		
7		
8		
12		
12		
13		
14		
15		
		$\sum(x - \bar{x})^2 =$

(ii) Use the table above to calculate the **Standard Deviation**.

Answer: $\sigma =$ _____
(3 marks)

36. Smith has a bag with 5 blue and 7 green lollies. Two lollies are drawn without replacement. He picked another lolly at random from the bag and did not replace it into the bag for the next pick.

i) **Complete the tree diagram by filling in the blank boxes.** (2 marks)



ii) Calculate that probability that Smith picks:

a) Two blue lollies

Ans: _____
(1 mark)

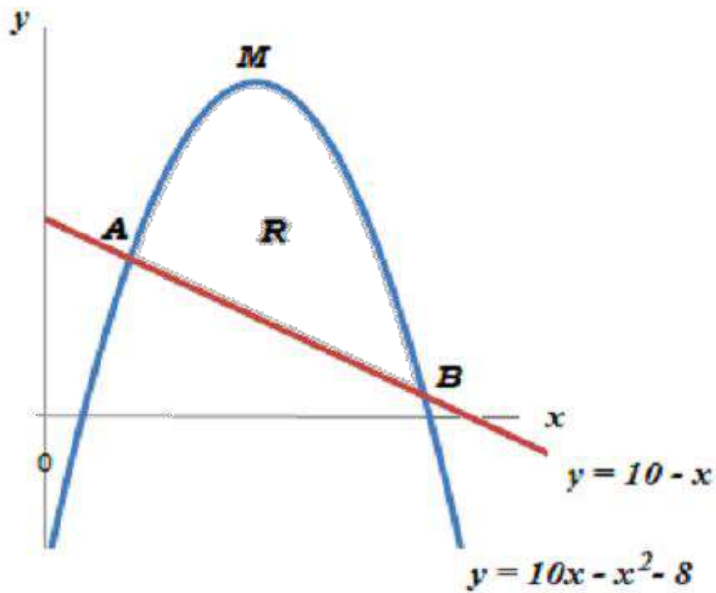
b) No blue lollies

Ans: _____
(1 mark)

c) At **least** one blue lolly

Ans: _____
(2 marks)

37. The figure shows a curve with equation $y = 10x - x^2 - 8$ and a line $y = 10 - x$.
 M is the highest point on the curve.



a) Calculate the coordinate of M .

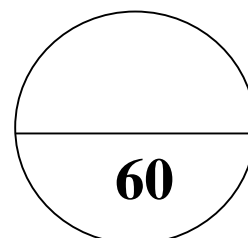
$M = (\underline{\hspace{2cm}}, \underline{\hspace{2cm}})$
(2 marks)

b) Calculate the coordinates of A and B.

A = (_____, _____)
(2 marks)

B = (_____, _____)
(2 marks)

Total Marks for Section C:



SISC – MATHEMATICS 2018

CENTRE NUMBER

CANDIDATE NUMBER

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SECTION A MULTIPLE CHOICE (20 MARKS)

Write the letter of the correct answer in the box provided. Make sure your answer is put alongside the right question number.

Example: If you consider A is the correct answer, write it like this:

A

To change your answer from A to C, Cross out A and write the new answer

C By the box, like this:

A

C

FOR MARKERS USE ONLY

SECTION	MARK	MARKER	SCRIPT CHECKER
A	20		
B	20		
C	60		
TOTAL	100		
Marker/ Checker Initials			

- | | |
|--|---|
| <p>1 <input style="width: 40px; height: 25px;" type="text"/></p> <p>2 <input style="width: 40px; height: 25px;" type="text"/></p> <p>3 <input style="width: 40px; height: 25px;" type="text"/></p> <p>4 <input style="width: 40px; height: 25px;" type="text"/></p> <p>5 <input style="width: 40px; height: 25px;" type="text"/></p> <p>6 <input style="width: 40px; height: 25px;" type="text"/></p> <p>7 <input style="width: 40px; height: 25px;" type="text"/></p> <p>8 <input style="width: 40px; height: 25px;" type="text"/></p> <p>9 <input style="width: 40px; height: 25px;" type="text"/></p> <p>10 <input style="width: 40px; height: 25px;" type="text"/></p> | <p>11 <input style="width: 40px; height: 25px;" type="text"/></p> <p>12 <input style="width: 40px; height: 25px;" type="text"/></p> <p>13 <input style="width: 40px; height: 25px;" type="text"/></p> <p>14 <input style="width: 40px; height: 25px;" type="text"/></p> <p>15 <input style="width: 40px; height: 25px;" type="text"/></p> <p>16 <input style="width: 40px; height: 25px;" type="text"/></p> <p>17 <input style="width: 40px; height: 25px;" type="text"/></p> <p>18 <input style="width: 40px; height: 25px;" type="text"/></p> <p>19 <input style="width: 40px; height: 25px;" type="text"/></p> <p>20 <input style="width: 40px; height: 25px;" type="text"/></p> |
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