| Centre <br> Number | Candidate <br> Number |
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|  |  |

## MINISTRY OF EDUCATION AND HUMAN RESOURCE DEVELOPMENT

## SOLOMON ISLANDS YEAR 9 EXAMINATION

## 2019

## MATHEMATICS

## WEDNESDAY $6^{\text {th }}$ NOVEMBER 9.00AM

| SECTION | CONTENT | MARKS |
| :--- | :--- | :---: |
| A | Multiple Choice Questions | 20 |
| B | Short Answer Questions | 45 |
| C | Long Answer Questions | $\underline{55}$ |
|  | TOTAL | $\underline{\mathbf{1 2 0}}$ |

## INSTRUCTIONS TO CANDIDATES

1. Do NOT open this Booklet until you are told to do so.
2. Write both your Centre Number and Candidate Number in the box provided at the top right hand corner and the back-flap at the end of this booklet.
3. Before you answer the questions, read through the instructions carefully.
4. Write all your answers in the spaces provided in this Booklet.
5. Calculators should NOT be used.
6. Show all your workings for Sections B and C. You may lose some marks if you do not show your workings.
7. Do NOT use correction fluid.
8. Mobile phones are NOT allowed in the Examination room.

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

## SECTION A: MULTIPLE CHOICE

## WRITE THE LETTER OF THE MOST CORRECT ANSWER IN THE BOX PROVIDED IN

 THE BACK-FLAP AT THE END OF THIS BOOKLET.1. Convert 45000000 grams to tonnes;
A. 4.5 tonnes
B. 45 tonnes
C. 450 tonnes
D. 0.45 tonnes.
2. The median for this set of numbers: $9,2,2,8,1,6,2,9,8,11$ is;
A. 1
B. 2
C. 5
D. 7
3. $\frac{2 m^{2}-4 m a}{2 m}$ simplified to its simplest term is;
A. $\frac{2 m-a}{2 m}$
B. $\frac{2 m^{2}-a}{2 m}$
C. $\frac{m-a}{2 m}$
D. $m-2 a$
4. Calculate $10^{4} \div 10^{5}=$
A. $\frac{1}{10}$
B. 10
C. $10^{9}$
D. $\frac{1}{100}$
5. Simplify $4 v^{2}-v^{3}-6 v^{2}-v^{3}=$
A. $-2 v^{2}-2 v^{3}$
B. $-2 v^{2}+2 v^{3}$
C. $2 v^{2}+2 v^{3}$
D. $2 v^{2}-2 v^{3}$
6. Solve $24-3 x=15$ for $\boldsymbol{x}$;
A. -3
B. 3
C. -13
D. 13
7. The value of $\boldsymbol{x}$ in the given diagram below is;
A. $50^{\circ}$
B. $60^{\circ}$
C. $70^{\circ}$
D. $80^{\circ}$

8. Find the size of the angle marked ' $\mathbf{y}$ ' in the circle below.
A. $30^{0}$
B. $50^{\circ}$
C. $90^{\circ}$
D. $180^{\circ}$

9. Express $37 \frac{1}{2} \%$ as a fraction in its simplest form.
A. $\frac{3}{8}$
B. $\frac{37.5}{100}$
C. $\quad \frac{375}{100}$
D. $\frac{37}{1000}$
10. The ratio of dad's age to mum's age is $5: 3$. If dad is 45 years old, how old is mum?
A. 27 years.
B. 40 years.
C. 45 years.
D. 60 years.
11. The area of the shape below is;

A. $\quad 3.5 \mathrm{~cm}^{2}$
B. $\quad 4.9 \mathrm{~cm}^{2}$
C. $35 \mathrm{~cm}^{2}$
D. $49 \mathrm{~cm}^{2}$
12. Five gallons of petrol cost $\$ 20.00$. How much would three gallons cost?
A. $\$ 4.00$
B. $\$ 12.00$
C. $\$ 60.00$
D. $\$ 100.00$
13. The gradient of the equation $2 x+y=-4$ is;
A. 2
B. -2
C. $-2 x$
D. -4
14. A map scale reading on a map is $1: 4000$ 000. How many kilometres over land does 1 cm on the map represent?
A. 40 km .
B. 400 km .
C. 40000 km .
D. 4000000 km .
15. Expand the expression $-6(2 x-y-z)$.
A. $12 x+6 y-6 z$
B. $-6 x-6 y+x$
C. $-8 x+6 y+z$
D. $-12 x+6 y+6 z$
16. Complementary angles are angles that add up to;
A. $90^{\circ}$
B. $180^{\circ}$
C. $270^{\circ}$
D. $360^{\circ}$
17. Angle marked with " $X$ " in the diagram below is;

A. $46^{\circ}$
B. $49^{\circ}$
C. $85^{\circ}$
D. $90^{\circ}$
18. Debbie received the following scores from her test in Mathematics.
$\mathbf{1 0}, \mathbf{8}, \mathbf{9}, 5,7,15$. What is her mean score to the nearest whole number?
A. 4
B. 6
C. 9
D. 17
19. Find the size of the angle marked " $X$ " in the diagram below;

A. $50^{\circ}$
B. $65^{\circ}$
C. $115^{\circ}$
D. $230^{\circ}$
20. The sum of two numbers is 42 . The first number is 6 less than 3 times the second number. Which of the following is the CORRECT expression that represents this statement?
A. $x+(3 x-6)=42$
B. $x+(3 x+6)=42$
C. $3 x-6=42$
D. $3 x+6=42$


THIS SECTION IS WORTH 45 MARKS. SHOW ALL YOUR WORKINGS AND WRITE THE ANSWER ON THE SPACES PROVIDED.
21. Simplify $\left(a^{0} b^{-1}\right)^{2}$ (Leave your answer to a positive power).

Answer = $\qquad$
22. Find the square root of 12100.
(Show all workings to get full marks. Write your answer correct to 3 significant figures).

Use the correct square root only $(\sqrt{1.21}=1.1$ or $\sqrt{12.1}=3.48)$

> Answer =
$\qquad$
23. Solve for " X " in the equation $5 \mathrm{x}-14=3 x+28$.

$$
X=\frac{}{\text { (2 marks) }}
$$

24. What is the altitude of an equilateral triangle whose sides are 10 cm ? (Write your answer correct to 3 significant figures).

Use the correct square root only $(\sqrt{25}=5, \sqrt{100}=10$ or $\sqrt{75=}=8.66)$
$\qquad$ cm (2 marks)
25. Express the ratio $0.75: 1 \frac{1}{2}: 2$ in its simplest form.

$$
0.75: 1 \frac{1}{2}: 2=
$$

$\qquad$
26. Vincent can run at a speed of 11.25 kilometres per hour. How far would he run in an hour and 20 minutes?

$$
\text { distance }=
$$

$\qquad$ km
(2 marks)
27. It is estimated that it would take 40 students 1.5 hours to cut the grass on a football pitch. How many students would be needed if it was required that the grass should be cut in 1 hour?

> Number of students =
$\qquad$ (2 marks)
28. Find the value of angle $\mathbf{A B C}$ in the diagram drawn below.


Angle $A B C=$ $\qquad$ (2 marks)
29. The equal angles of a pair of isosceles triangles are $55^{\circ}$ and $80^{\circ}$ respectively. What is the ratio of the third angle of the first triangle to the third angle of the second triangle?

$$
\text { Ratio }=\frac{}{(2 \text { marks })}
$$

30. Find the radius of a circle given the circumference 44 cm . (Use $\pi=\frac{22}{7}$ ).
Radius =
$\qquad$
31. Job decided to loan $\$ 110000.00$ from Bank South Pacific (BSP) with an interest repayment of $\$ 37400.00$, which is equivalent to $17 \%$ to buy a truck. How many years would it take him to fully repay his loan?

> Number of years =
$\qquad$
32. Find the square root of 0.00531 using standard form correct to three significant figures. (Show all workings to get full marks).

Use the correct square root only $(\sqrt{5.31}=2.30$ or $\sqrt{53.1}=7.29)$

> Answer =
$\qquad$
(3 marks)
33. Arrange the following numbers in ascending order.
$\frac{9}{8}, 1.2,115 \%, 1 \frac{1}{6}$

Answer = $\qquad$
$\qquad$
34. Calculate for " $Y$ " in the equation $5(5 y-11)=6(2 y-7)$

$$
\text { Value of } \boldsymbol{y}=\overline{(2 \text { marks })}
$$

35. Find the image of the shape below using the vector (translation) $\binom{-4}{2}$ (Label the image correctly to get full marks).

(2 marks)
36. In the figure below, ' $\mathbf{O}$ ' is the centre of the circle.


Find the size of angles " $\mathbf{X}$ " and " $\mathbf{Y}$ ":

Angle $\mathbf{X}=\varlimsup_{(2 \text { marks })}{ }^{\circ}$

Angle $\boldsymbol{Y}=$ $\qquad$
37. Identify the gradient and the equation $(y=m x \pm c)$ of the line graph below.


The gradient $=$ $\qquad$
The equation $=$ $\qquad$
(2 marks)
38. Amelia cleared her flower garden which is in a triangular shape as shown below.


Use the sine rule for calculating area of triangle $\left(i e ;\right.$ Area $\left.=\frac{1}{2} a b \sin C\right)$
a. Use the given information above; write an equation to find the area of land Amelia uses to clear her flower garden.
(Write the equation in simplified form).

Equation = $\qquad$
b. If the angle at point A is $45^{\circ}$ and angle at point C is $30^{\circ}$, find the area of land cleared. Use the correct ratio (sine $45^{\circ}=0.7$, sine $30^{\circ}=0.5$ ).

$$
\text { Area }=
$$

$\qquad$
$\qquad$
39. The height of a tree is 25 m , and it casts a shadow of length 10.5 m . Find the angle of elevation of the sun from the ground.

Given the trig ratios: ( $\operatorname{Sin} \theta=0.42, \operatorname{Cos} \theta=0.42, \operatorname{Tan} \theta=2.38)$.

Angle of elevation = $\qquad$ (2 marks)
40. The distribution of students participated in the Inter-Secondary school sports carnival in June by Province is shown in the pie chart below.


What percentage of the total participants are from Malaita Province?

Answer = $\qquad$ \%
(2 marks)

Total marks for Section B:


## SHOW ALL YOUR WORKINGS AND WRITE THE ANSWER ON THE SPACES PROVIDED.

41. In the diagram below, Shadrack is standing due east of Lionel and north of Martin with the distance of 15 km and 20 km respectively.

a) What is the bearing of Shadrack from Lionel?

> bearing=
$\qquad$
b) Find the bearing of Martin from Lionel.

$$
\text { bearing }=\varlimsup_{(2 \text { marks })}{ }^{\circ}
$$

c) Find the distance of Martin from Shadrack.

Distance $=$ $\qquad$ km (2 marks)
42. The shaded region below is three-quarters of a circle whose radius is 18 cm . (Use $\pi=3.1$ )

(a) Find the arc length of the shaded region.

$$
\text { Arc length }=\varlimsup_{(3 \text { marks })} \mathrm{cm}
$$

(b) Find the perimeter of the circle.

$$
\text { Perimeter }=\varlimsup_{(2 \text { marks })} \mathrm{cm}
$$

(c) Find the area of the shaded region correct to one decimal place.

$$
\text { Area of the shaded region }=\ldots \mathrm{cm}^{2}
$$

43. For this straight line equation $y+3 x-5=0$.
(a) Find its gradient.
gradient $=$ $\qquad$
(b) Calculate for $y$-intercept when $x=0$.

$$
y \text {-intercept }=\overline{(1 \text { marks })}
$$

(c) Calculate for $x$-intercept when $y=0$.

$$
\text { x-intercept }=\overline{(1 \text { marks })}
$$

(d) Use the grid below to plot the graph of $y+3 x-5=0$.

(3 marks)
44. The dimensions of cuboid $\mathbf{A}$ are twice those of cuboid $\mathbf{B}$ as shown in the diagrams below.

(a) Calculate the volume of cuboid B.

Volume of cuboid $\mathbf{B}=$ $\qquad$ $\mathrm{m}^{3}$
(2 marks)
(b) Calculate the volume of cuboid $\mathbf{A}$.

Volume of cuboid $\mathbf{A}=$ $\qquad$ $\mathrm{m}^{3}$
(2 marks)
(c) What is the ratio of the volume of cuboid $\mathbf{B}$ to the volume of cuboid $\mathbf{A}$ in its simplest form?

Volume of $\mathbf{B}$ : Volume of $\mathbf{A}=$ $\qquad$
$\qquad$
45. Craddock wishes to purchase a TV set costing \$8000 from Discount Electrics Ltd on a hire purchase basis. A 20\% deposit is required to be paid upfront and the balance to be paid over 2 years at an interest rate of $15 \%$.

Find:
a) The amount of deposit.
Amount $=\$ \xlongequal[(2 \text { marks })]{ }$
b) The balance to be paid.

$$
\text { Balance }=\$ \frac{}{(2 \text { marks })}
$$

c) The total amount to be repaid.

46. Line $A B$ crosses line $C D$ at point $M$.

(a) Find the value of " $X$ " in the diagram above.

$$
X=\frac{}{(2 \text { marks })}
$$

(b) Find the size of angle AMD:

$$
\text { Angle AMD }=\overline{(2 \text { marks })}_{\circ}^{\circ}
$$

47. The triangle $A B C$ is to be reflected on a mirror line $x=0$.

a) Draw the mirror line on the grid above.
b) Draw the image of triangle $\mathbf{A B C}$ and labelled as $\mathbf{A}^{\prime} \mathbf{B}^{\prime} \mathbf{C}^{\prime}$.
( 2 marks)
c) If triangle $A B C$ was to be rotated about $(\mathbf{0}, \mathbf{0})$ through $-90^{\circ}$, write down the coordinates of the image of point $\mathbf{B}$.
48. Peter who is 1.5 metres tall is trying to find the height of his schools' flagpole using a clinometer. The diagram below shows what Peter did.


Find the total height of the Flagpole to the nearest tenth.
Use the correct ratio; $\binom{\tan 30^{\circ}=0.577, \sin 30^{\circ}=0.5, \cos 30^{\circ}=0.866}{\tan =60^{\circ}=1.73, \sin 60^{\circ}=0.866, \cos 60^{\circ}=0.5}$

Height = $\qquad$ m
(4 marks)
49. From the table below, calculate the range, mode, median and mean.

| Score ( $\boldsymbol{x}$ ) | Frequency $(\boldsymbol{f})$ | $\boldsymbol{f} \boldsymbol{x}$ |
| :---: | :---: | :---: |
| 5 | 1 | 5 |
| 6 | 5 | 30 |
| 7 | 5 | 35 |
| 8 | 4 | 32 |
| 9 | 3 | 27 |
| 10 | 2 | 20 |
| Total | $\mathbf{2 0}$ | $\mathbf{1 4 9}$ |

a) Range
range $=$
(1 mark)
b) Mode
mode $=$ $\qquad$
c) Median

$$
\text { median }=\frac{}{(2 \text { marks })}
$$

d) mean
$\qquad$
(2 marks)
50. The average rainfalls for Honiara City in 2018 were recorded and graphed as shown below. Use the graph to answer questions (i - iii) that follow.

i) What was the average rainfall in Honiara City in June?

Answer: $\qquad$ mm (1 mark)
ii) Which TWO (2) months was the average rainfall in Honiara City 200mm?

Answer: $\qquad$
(2 marks)
iii) Which month has the LOWEST average rainfall? Why?

Answer: $\qquad$
(1 mark)

Reason: $\qquad$
(2 marks)

Total marks for Section C:


## SIY9 - MATHEMATICS 2019

ANSWER SHEET - MULTIPLE CHOICE You are to write the letter of the correct answer only



FOR MARKER USE ONLY

| SECTION | MARKS | MARKER | CHECKER |
| :---: | :---: | :---: | :---: |
| A | 20 |  |  |
| B | 45 |  |  |
| C | 55 |  |  |
| TOTAL | 120 |  |  |
| Marker/ |  |  |  |

