CARIBBEAN EXAMINATIONS COUNCIL
CARIBBEAN SECONDARY EDUCATION CERTIFICATE ${ }^{\circledR}$ EXAMINATION

| "*" ${ }^{2}$ Barcode Area"*" |
| :--- |
| Front Page Bar Code |

## 15 MAY 2019 (p.m.)

FILL IN ALL THE INFORMATION REQUESTED CLEARLY IN CAPITAL LETTERS.

TEST CODE | 0 | 1 | 2 | 3 | 4 | 0 | 3 | 2 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |

SUBJECT $\qquad$ MATHEMATICS - Paper 032

PROFICIENCY $\qquad$ GENERAL

REGISTRATION NUMBER


| NAME OF SCHOOL/CENTRE |
| :---: |
|  |


| CANDIDATE'S FULL NAME (FIRST, MIDDLE, LAST) |
| :---: |
|  |

DATE OF BIRTH

| $D$ | $D$ | $M$ | $M$ | $Y$ | $Y$ | $Y$ | $Y$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

SIGNATURE $\qquad$

| "*"Barcode Area"*" |
| :---: |
| Sequential Bar Code |


test code 01234032
MAY/JUNE 2019

## CARIBBEAN EXAMINATIONS COUNCIL <br> CARIBBEAN SECONDARY EDUCATION CERTIFICATE ${ }^{\circledR}$ EXAMINATION <br> MATHEMATICS

## Paper 032 - General Proficiency

## 1 hour

## READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of TWO questions. Answer ALL questions.
2. Write your answers in the spaces provided in this booklet.
3. Do NOT write in the margins.
4. All working MUST be clearly shown.
5. A list of formulae is provided on page $\mathbf{4}$ of this booklet.
6. If you need to rewrite any answer and there is not enough space to do so on the original page, you must use the extra page(s) provided at the back of this booklet. Remember to draw a line through your original answer.
7. If you use the extra page(s) you MUST write the question number clearly in the box provided at the top of the extra page(s) and, where relevant, include the question part beside the answer.

## Required Examination Materials

Electronic calculator
Geometry set

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

| "*"Barcode Area"*" |
| :---: |
| Sequential Bar Code |

## LIST OF FORMULAE

| Volume of a prism | $V=A h$ where $A$ is the area of the cross-section and $h$ is the perpendicular length. |
| :---: | :---: |
| Volume of a cylinder | $V=\pi r^{2} h$ where $r$ is the radius of the base and $h$ is the perpendicular height. |
| Volume of a right pyramid | $V=\frac{1}{3} A h$ where $A$ is the area of the base and $h$ is the perpendicular height. |
| Circumference | $C=2 \pi r$ where $r$ is the radius of the circle. |
| Arc length | $S=\frac{\theta}{360} \times 2 \pi r$ where $\theta$ is the angle subtended by the arc, measured in degrees. |

Area of a circle
Area of a sector

Area of a trapezium

Roots of quadratic equations
If $a x^{2}+b x+c=0$,
then $x=\frac{-b \pm \sqrt{b^{2}-4 a c}}{2 \mathrm{a}}$

Trigonometric ratios

Area of a triangle

Sine rule

Cosine rule

$$
a^{2}=b^{2}+c^{2}-2 b c \cos A
$$



Area of $\Delta=\frac{1}{2} b h$ where $b$ is the length of the base and $h$ is the perpendicular height.

Area of $\triangle A B C=\frac{1}{2} a b \sin C$
Area of $\triangle A B C=\sqrt{s(s-a)(s-b)(s-c)}$
where $s=\frac{a+b+c}{2}$
$\frac{a}{\sin A}=\frac{b}{\sin B}=\frac{c}{\sin C}$


GO ON TO THE NEXT PAGE
01234032/MJ/CSEC 2019

| "*"Barcode Area"*" |
| :--- |
| Sequential Bar Code |

1. A company which employs 10 unskilled and 8 skilled workers produces two models of a toy, Model A and Model B.

- Model A requires 20 hours of unskilled labour while Model B requires 15 hours of unskilled labour
- Model A requires 10 hours of skilled labour while Model B requires 25 hours of skilled labour

Each worker provides 40 hours of labour per week.
(a) Calculate the maximum number of hours available per week for
(i) unskilled labour
(ii) skilled labour
(b) Assume that the factory makes $x$ Model A and $y$ Model B toys per week. Show that the inequalities for the hours of labour are
(i) unskilled labour, $4 x+3 y \leq 80$
(ii) skilled labour, $2 x+5 y \leq 64$.
(c) Show, by calculation, that it is possible to make 15 Model A toys and 5 Model B toys.
(d) The factory makes a profit of $\$ 40$ on a Model A toy and $\$ 60$ on a Model B toy each week.
(i) Write an equation for the TOTAL profit, $P$, per week, for making $x$ Model A and $y$ Model B toys.
$\qquad$
(ii) What is the profit to the company when it makes 15 Model A toys and 5 Model B toys?
$\qquad$
(e) Show that the profit calculated in (d) (ii) is NOT the maximum profit.
"*"Barcode Area"*"
Sequential Bar Code
2. The diagram below, not drawn to scale, shows a flexible piece of card in the shape of a sector of a circle with centre $O$ and radius 18 cm .

Use $\boldsymbol{\pi}=\frac{22}{7}$

(a) Show that the perimeter of the card is 80 cm .
(b) Calculate the area of the card $O P Q R$.
"*"Barcode Area"*
Sequential Bar Code
(c) The card is bent and the edges $O P$ and $O R$ are taped together so that the card forms the curved surface of a cone with a circular base, $P Q R$.
(i) Draw a diagram of the cone formed, showing clearly the measurement 18 cm , the perpendicular height, $h$, and the radius, $r$, of the base of the cone.
(ii) Calculate the radius of the circular base of the cone.
(iii) Using Pythagoras' theorem, or otherwise, determine the perpendicular height of the resulting cone.

## END OF TEST

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST.

## EXTRA SPACE

If you use this extra page, you MUST write the question number clearly in the box provided. Question No. $\square$
"*"Barcode Area"
Sequential Bar Code

## EXTRA SPACE

If you use this extra page, you MUST write the question number clearly in the box provided. Question No. $\square$
"*" Barcode Area" Sequential Bar Code

## EXTRA SPACE

If you use this extra page, you MUST write the question number clearly in the box provided. Question No. $\square$
"*"Barcode Area"
Sequential Bar Code

## EXTRA SPACE

If you use this extra page, you MUST write the question number clearly in the box provided. Question No. $\square$
"*" Barcode Area"
Sequential Bar Code


## CANDIDATE'S RECEIPT

## INSTRUCTIONS TO CANDIDATE:

1. Fill in all the information requested clearly in capital letters.

TEST CODE:

| 0 | 1 | 2 | 3 | 4 | 0 | 3 | 2 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

SUBJECT: MATHEMATICS - Paper 032

PROFICIENCY: GENERAL

REGISTRATION NUMBER: $\square$

FULL NAME: $\qquad$
(BLOCK LETTERS)

Signature: $\qquad$

Date: $\qquad$
2. Ensure that this slip is detached by the Supervisor or Invigilator and given to you when you hand in this booklet.
3. Keep it in a safe place until you have received your results.

## INSTRUCTION TO SUPERVISOR/INVIGILATOR:

Sign the declaration below, detach this slip and hand it to the candidate as his/her receipt for this booklet | collected by you.

I hereby acknowledge receipt of the candidate's booklet for the examination stated above.

Signature: $\qquad$
Supervisor/Invigilator

Date: $\qquad$

