FORM TP 2026–046

TEST CODE 01254020

MAY–JUNE 2026

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

ADDITIONAL MATHEMATICS

Paper 02 – General Proficiency

2 hours 40 minutes

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READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of SIX questions. Answer ALL questions.
2. Write your answers in the spaces provided in this booklet.
3. Do NOT write in the margins.
4. A list of formulae is provided on page 4 of this booklet.
5. 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.**
6. **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.**

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Required Examination Materials

Electronic calculator (non-programmable)
Geometry set

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LIST OF FORMULAE

Arithmetic series $T_n = a + (n-1)d \qquad S_2 = \frac{n}{2}[2a + (n-1)d]$

Geometric series $T_n = ar^{n-1} \qquad S_n = \frac{a(r^n - 1)}{r - 1} \qquad S_\infty = \frac{a}{1-r}, -1 < r < 1 \text{ or } |r| < 1$

Circle $x^2 + y^2 + 2fx + 2gy + c = 0 \qquad (x + f)^2 + (y + g)^2 = r^2$

Vectors $\mathbf{v} = \frac{\mathbf{v}}{|\mathbf{v}|} \qquad \cos\theta = \frac{\mathbf{a} \cdot \mathbf{b}}{|\mathbf{a}| \bullet |\mathbf{b}|} \qquad |\mathbf{v}| = \sqrt{(x^2 + y^2)} \text{ where } \mathbf{v} = x\mathbf{i} + y\mathbf{j}$

Trigonometry

$$\sin(A \pm B) \equiv \sin A \cos B \pm \cos A \sin B$$

$$\cos(A \pm B) \equiv \cos A \cos B \mp \sin A \sin B$$

$$\tan(A \pm B) \equiv \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$$

Kinematics $v = u + at \qquad v^2 = u^2 + 2as \qquad s = ut + \frac{1}{2}at^2 \qquad v = \frac{dx}{dt} = \dot{x}$

$$a = \frac{d^2x}{dt^2} = \frac{dv}{dt} = \ddot{x}$$

Calculus $\frac{d}{dx}(ax + b)^n = an(ax + b)^{n-1} \qquad \frac{d}{dx}\sin ax = a\cos ax$

$$\frac{d}{dx}\cos ax = -a\sin ax \qquad s = \int v\,dt \qquad v = \int a\,dt$$

Statistics $\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n} = \frac{\sum_{i=1}^{n} f_i x_i}{\sum_{i=1}^{n} f_i}, \qquad s^2 = \frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1} = \frac{\sum_{i=1}^{n} f_i x_i^2}{\sum_{i=1}^{n} f_i} - (\bar{x})^2$

Probability $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

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SECTION I

ALGEBRA, SEQUENCES AND SERIES

ALL working must be clearly shown.

1. (a) Determine the value of the following expression, giving your answer in its simplest form.

$$\frac{8}{\sqrt{3}} - \frac{5}{\sqrt{27}}$$

(3 marks)

(b) Factorize the following polynomial completely, giving your answer as a product of its linear factors.

$$x^4 - 29x^2 + 100$$

(3 marks)

(c) Figure 1 shows the steps in a student's solution for the equation $\log_3(5x + 1) - \log_3(x - 4) = 2$. The student made an error in the working which resulted in an incorrect solution.

Step 1:	$\log_3 \frac{5x + 1}{x - 4} = 2$
Step 2:	$\frac{5x + 1}{x - 4} = 2^3$
Step 3:	$5x + 1 = 8x - 32$
Step 4:	$3x = 33$
Step 5:	$x = 11$

Figure 1. Worked solution to a logarithmic equation

Identify the step in which the student made the initial error **and** correctly rework the solution **from that step**.

Step with initial error .....

(3 marks)

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(d) (i) Determine the values of m for which the equation $x^2 + (m - 1)x + 2m + 3 = 0$ has equal roots.

(4 marks)

(ii) Hence, determine the value of x that satisfies the equation.

(2 marks)

Total 15 marks

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2. (a) (i) Substitute $y = 2^x$ in the exponential equation $3(4^x) - 2^x - 4 = 0$.

(3 marks)

(ii) Solve the resulting equation from (a) (i) in terms of y.

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(2 marks)

(b) Find the range of values of x for which $\frac{x+5}{x+1} \leq 0$.

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(4 marks)

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(c) (i) An accountant is offered a five-year contract with an annual increase. The accountant earned a salary of $56 000 and $61 000 in the third and fifth year respectively. If the increase was the same each year, calculate the total amount earned at the end of the five-year period.

(3 marks)

(ii) Find the sum to infinity of the following geometric series

$$6 - \frac{18}{5} + \frac{54}{25} - \frac{162}{125} + \ldots$$

(3 marks)

Total 15 marks

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SECTION II

COORDINATE GEOMETRY, VECTORS AND TRIGONOMETRY

ALL working must be clearly shown.

3. (a) A circle with equation $(x - 2)^2 + (y - 1)^2 = 5$ intersects the x and y-axes at three points.

(i) State the radius of the circle.

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(1 mark)

(ii) Determine the coordinates of the THREE points of intersection.

(4 marks)

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(b) Figure 2 shows a portion of land, ABCD, in which ABC represents a sector of a circle with centre C and CDA is a right-angled triangle. Section ABC of the land is used for building and the remainder for farming. The radius BC is 20 m and Angle BCD is a right angle.

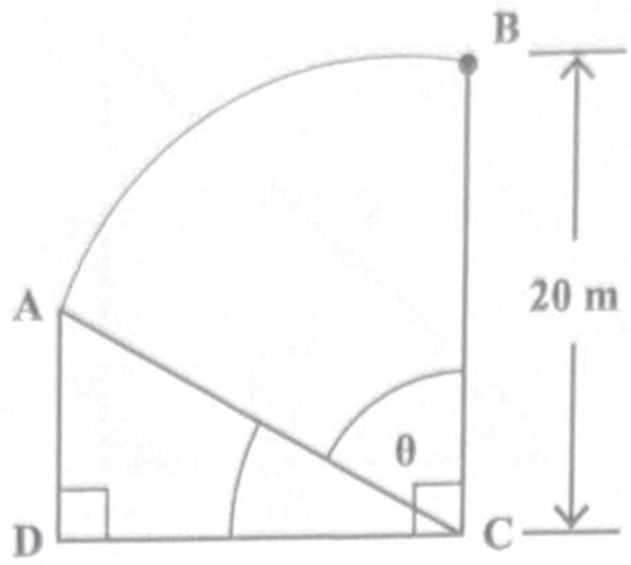


Figure 2. Portion of land, ABCD

(i) Given that the area of the building space is $\frac{200\pi}{3}$ m^2, calculate the angle ACB, in radians.

(1 mark)

(ii) Calculate the area of the land used for farming.

(4 marks)

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(c) (i) A boat begins at Point O and travels to Position B in the direction $3\mathbf{i} - 4\mathbf{j}$ units, then proceeds to Point C in the direction $-5\mathbf{i} + 13\mathbf{j}$ units.

Determine $\overrightarrow{OC}$.

(3 marks)

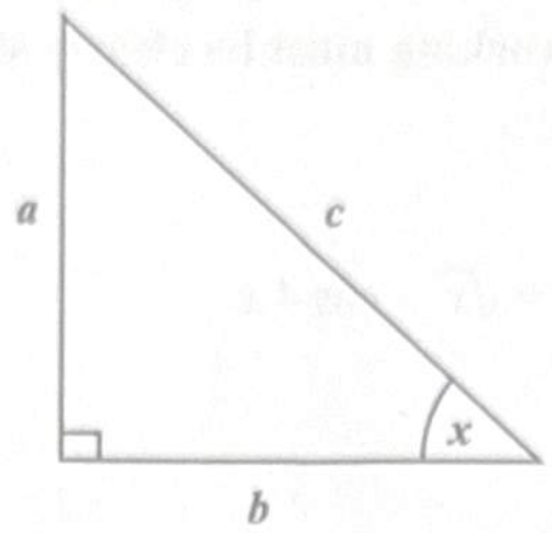
(ii) Hence, show that the scalar product of $\overrightarrow{OB}$ and $\overrightarrow{OC}$ is -42.

(3 marks)

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(d) Using the right-angled triangle below, derive the identity $\sin^2 x + \cos^2 x = 1$.



(4 marks)

Total 20 marks

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SECTION III

INTRODUCTORY CALCULUS

ALL working must be clearly shown.

4. (a) Find

(i) $f'(x)$ given $f(x) = \sqrt{x} - \cos 4x$

(3 marks)

(ii) $g''(x)$ given $g(x) = (x + 1)^4$.

(3 marks)

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(b) Each side of a block of ice in the shape of a cube is melting uniformly at a rate of $\frac{1}{3}$ cm/min. At what rate is the ice block's surface area melting when the sides of the ice block are 150 cm? Include the units in your final answer.

(5 marks)

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(c) Figure 3 shows the velocity–time graph for the motion of a particle for the first 11 seconds of its journey.

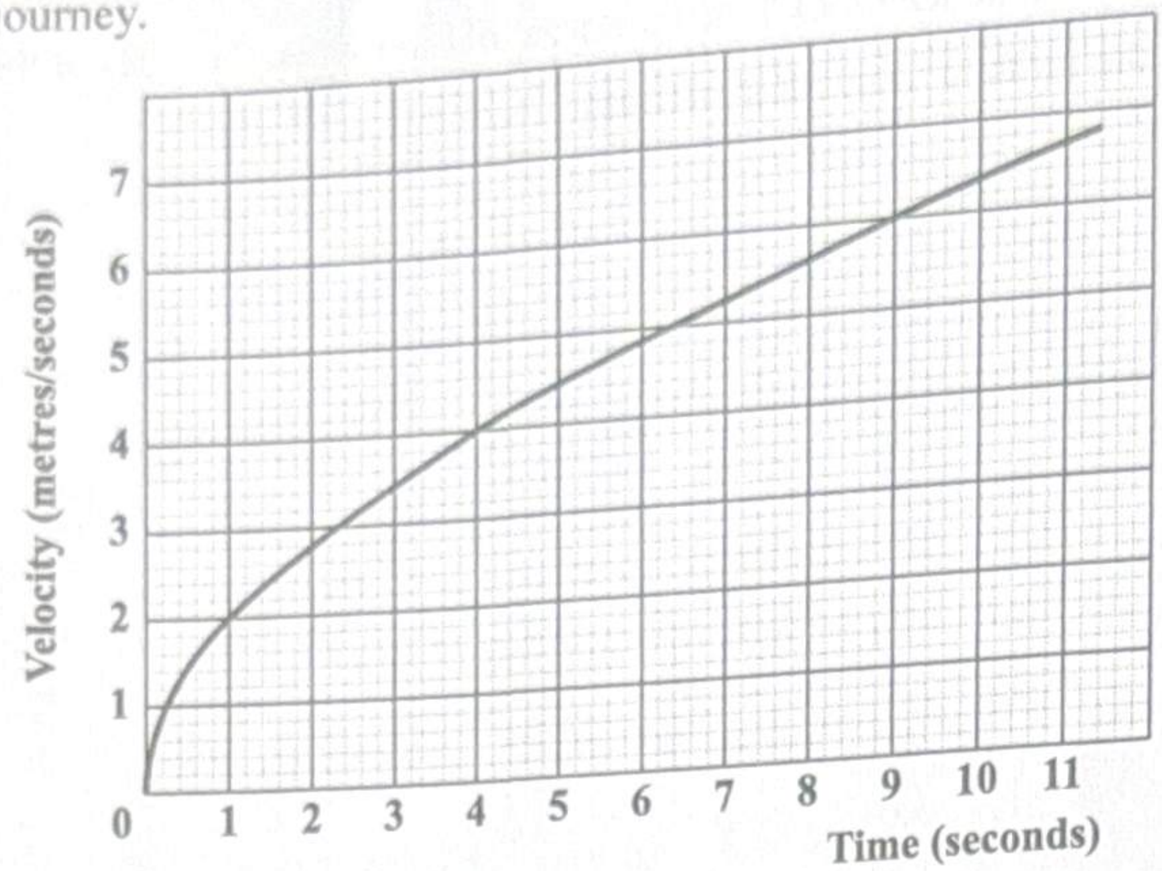


Figure 3. Velocity–time graph

Using the graph in Figure 3, determine an approximate value for the acceleration of the particle at time $t = 4$ seconds. Give your answer to 1 decimal place.

(4 marks)

Total 15 marks

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5. (a) Find the area of the finite region bounded by the curve $y = -2x^2 + 7x$ and the lines $x = 2$ and $x = 1$.

(4 marks)

(b) Find the volume of the solid of revolution in terms of π for the region bounded by the curve $y = 2x^2 - 3$, the x-axis and the lines $x = 0$ and $x = 1$.

(3 marks)

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(c) Determine the equation of a curve whose gradient is $\frac{dy}{dx} = \frac{10\,(5x+1)^2}{3}$ and passes through the point $A\left(0, \frac{7}{9}\right)$.

(4 marks)

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(d) The velocity, v, of a particle moving in a straight line is given by $v = (5t - 6)^{\frac{1}{2}}$ ms^{-1}, where t is the time in seconds which has elapsed since the particle passed through a fixed point O. Derive an expression in terms of t for the displacement of the particle from O, when $t = 2$ and the displacement of the particle is 3 m.

(4 marks)

Total 15 marks

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SECTION IV

PROBABILITY AND STATISTICS

ALL working must be clearly shown.

6. Table 1 shows the preferred social media platform for 270 students.

TABLE 1: STUDENTS' SOCIAL MEDIA PREFERENCES

Gender	Instagram	TikTok	Total
Male	50	60	110
Female	70	90	160
Total	120	150	270

(a) Find the probability that a student

(i) prefers Instagram and is a female

(1 mark)

(ii) prefers TikTok given that the student is a male

(2 marks)

(iii) is male or prefers Instagram.

(3 marks)

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(b) Table 2 shows the scores 35 randomly selected students earned on a pop quiz that was given after a field trip.

TABLE 2: STUDENTS' SCORES ON A POP QUIZ

42	96	97	73	75
51	52	84	55	60
63	66	70	99	71
71	76	76	76	77
78	79	80	84	84
84	88	60	92	93
94	98	72	73	42

(i) Construct a stem-and-leaf diagram to show the scores of the students.

(3 marks)

(ii) State ONE conclusion that can be drawn about the distribution based on the shape of the stem-and-leaf plot in (b) (i).

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(1 mark)

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(iii) Calculate the 25th, 50th and 75th percentiles.

(6 marks)

(iv) Hence, find the semi-interquartile range.

(2 marks)

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(c) State ONE advantage of displaying the students' scores on the quiz via a stem-and-leaf diagram as opposed to a box-and-whisker diagram.

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(2 marks)

Total 20 marks

END OF TEST

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

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