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MATHEMATICS

PAPER 2 (CORE/EXTENDED) 3815/2

Wednesday **21 MAY 2025** 9:00 A.M.–11:00 A.M.

Additional materials:
Calculator (not graphing)
Geometrical instruments
Answer booklet
Graph paper

MINISTRY OF EDUCATION NATIONAL EXAMINATIONS

BAHAMAS GENERAL CERTIFICATE OF SECONDARY EDUCATION

INSTRUCTIONS TO CANDIDATES

Do not open this booklet until you are told to do so.

Write your school number, candidate number, surname and initials in the spaces provided on the **answer booklet**.

Remove the graph paper from the question paper. Write your school number, candidate number, surname and initials, signature and date on the graph paper. Place the graph paper in the answer booklet.

Answer **ALL** questions in the answer booklet.

ALL working must be shown.

ALL working must be done in blue or black ink, except for drawings, lines and constructions which may be done in pencil.

INFORMATION FOR CANDIDATES

Calculators may be used. **[NO GRAPHING CALCULATORS ALLOWED]**.

Tracing paper and geometrical instruments may be used.

The mark for each question, or part question, is shown in brackets [].

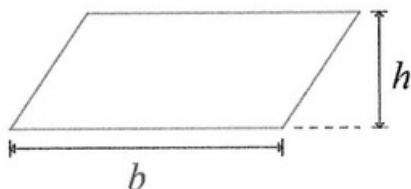
The total number of marks for this paper is 100.

This question paper consists of 8 printed pages.

INFORMATION AND FORMULAE

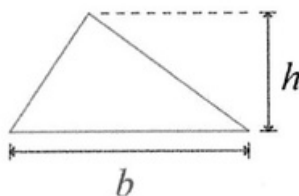
MENSURATION

Parallelogram



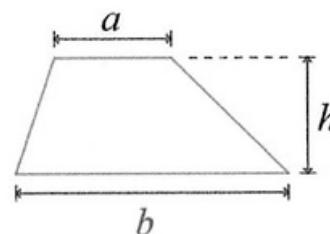
$$\text{Area} = bh$$

Triangle



$$\text{Area} = \frac{1}{2}bh$$

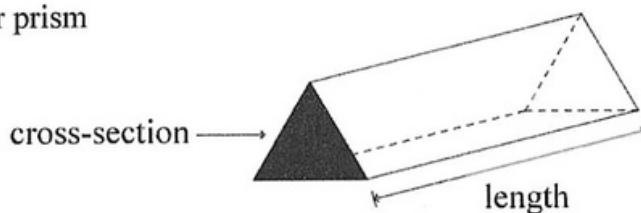
Trapezium



$$\text{Area} = \frac{1}{2}(a+b)h$$

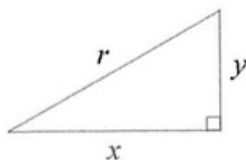
Circle (radius r , diameter d)	Circumference	$2\pi r$ or πd
	Area	πr^2
Cylinder (radius r , height h)	Volume	$\pi r^2 h$
Prism	Volume	area of cross-section $\times$ length

e.g. triangular prism

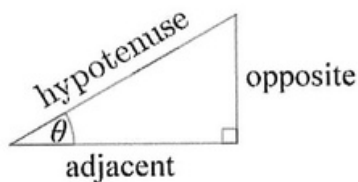


TRIGONOMETRY

Right-angled Triangle:



$$r^2 = x^2 + y^2 \quad (\text{Result of Pythagoras})$$



$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}, \quad \cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}, \quad \tan \theta = \frac{\text{opposite}}{\text{adjacent}}$$



NUMBER

Standard Form is $a \times 10^n$ where $1 \leq a < 10$ and n is an integer.

1. (a) Given that $M = p^2q - 3p$, find the value of M when $p = -2$ and $q = 3$. [3]
- (b) Make q the subject of the formula $M = p^2q - 3p$. [2]
-

2. Solve $4(x - 3) = 2(x + 8)$. [4]
-

3. The centre of the Milky Way galaxy is 25,800 light-years from Earth.

1 light-year = 9.461×10^{12} kilometres.

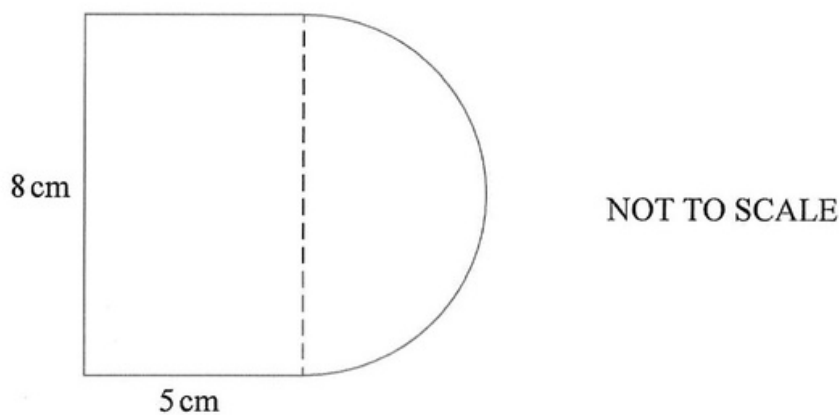
For this problem give all answers in standard form correct to three significant figures.

- (a) Find the distance in kilometres (km) between the Earth and the centre of the Milky Way. [2]

The fastest speed obtained by a man-made spacecraft is 586,000 km/h.

- (b) Find the time in hours needed to travel one light-year. [3]
-

4.



The compound figure above comprises a rectangle and a semicircle.

Using $\pi \approx 3.14$ where necessary, find:

- (a) the total area of the figure, [4]
- (b) the total perimeter of the figure. [3]
-

5. (a) Solve the inequality $15 - 3x \geq 8x + 7$. [2]
- (b) Show the solution to (a) on a number line. [2]
- (c) Give the solution set if x is a natural number. [1]
-

6. Solve the pair of simultaneous equations.

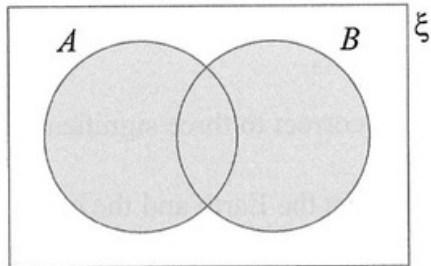
$$2x + 3y = 34$$

$$5x - 7y = -31$$

[5]

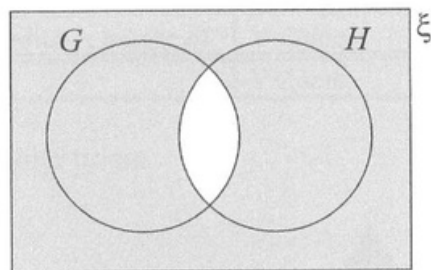
7. Use set symbols to identify the shaded regions:

(a)



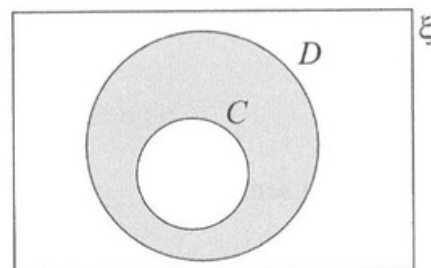
[1]

(b)



[1]

(c)



[1]

8. (a) Simplify the following:

(i) $3(m + 2n) - (m + 3n)$

[4]

(ii) $\left(\frac{a^2}{2b}\right)^3$

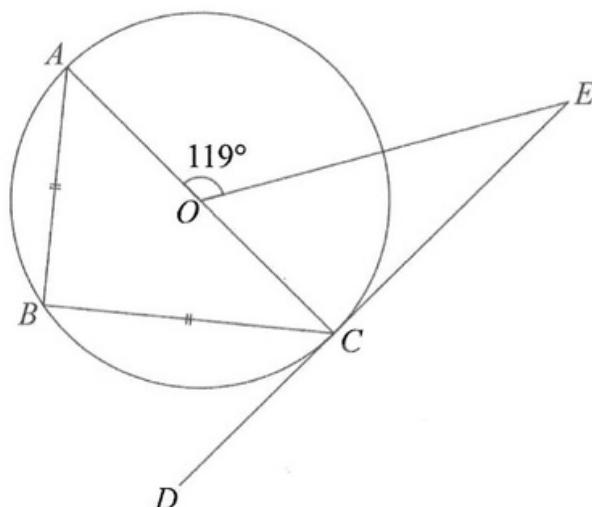
[3]

- (b) Factorise $5a^2b - 10a^2b^2$.

[3]



9.

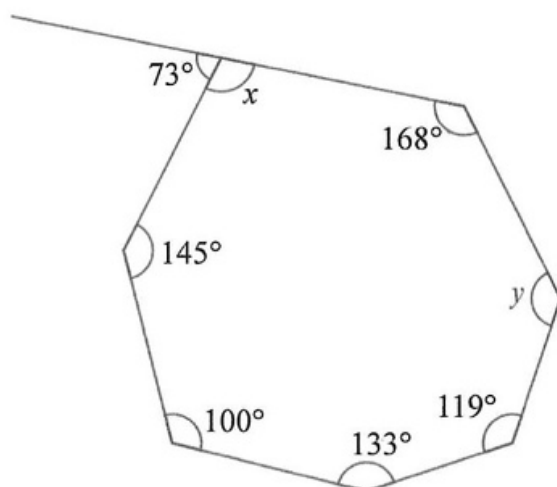


NOT TO SCALE

In the diagram, O is the centre of the circle,
 DE is tangent to the circle at C and AC is a diameter.
 Find the sizes of the following angles:

- | | | |
|-----|-------------|-----|
| (a) | $\hat{EOC}$ | [1] |
| (b) | $\hat{OCE}$ | [1] |
| (c) | $\hat{CEO}$ | [1] |
| (d) | $\hat{ABC}$ | [1] |
| (e) | $\hat{BCA}$ | [1] |

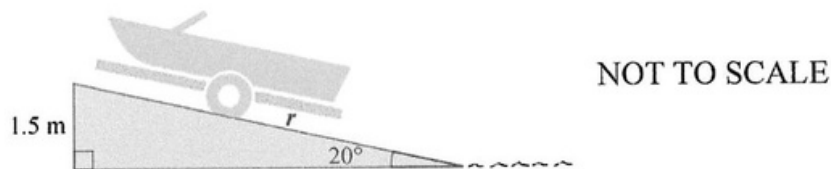
10.



NOT TO SCALE

- | | | |
|-----|---|-----|
| (a) | Find the sizes of angles x and y . | [3] |
| (b) | The sum of 5 interior angles of an octagon is 639° . If the remaining angles are equal, find the size of each. | [3] |

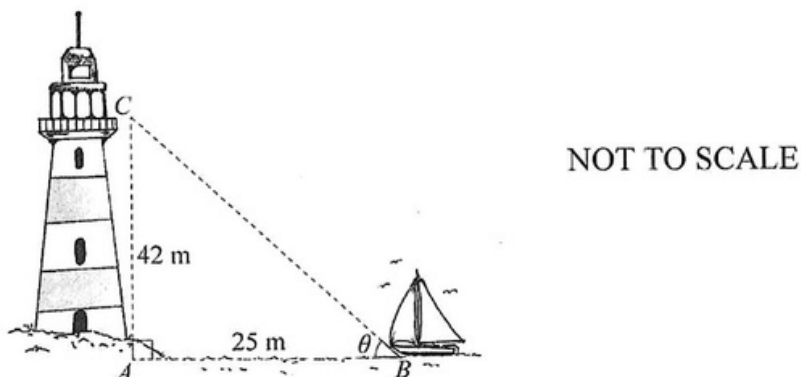
11.



A boat ramp 1.5 m high is at a slope of 20° .

- (a) Calculate the length (r) of the ramp, correct to 1 decimal place.

[3]



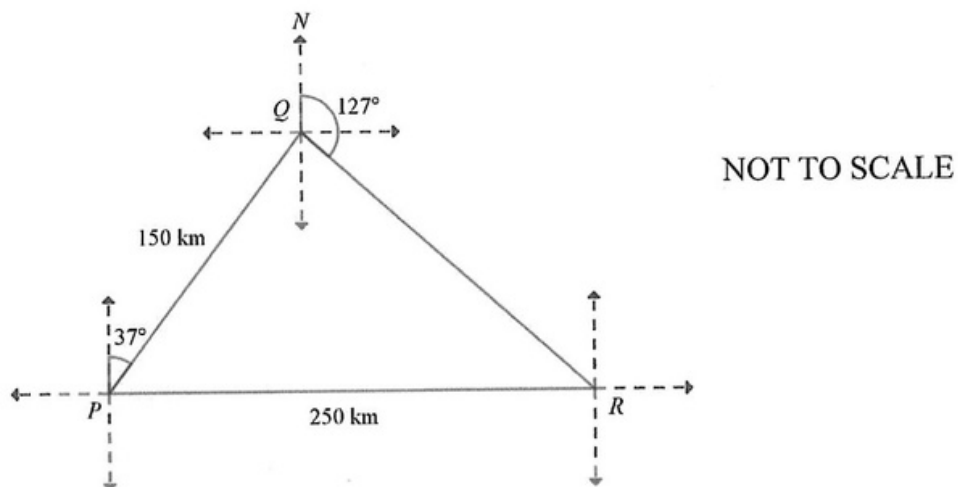
A boat is 25 m offshore as shown above.

C is the lookout point of the lighthouse 42 m above ground.

- (b) Calculate the size of angle θ , correct to the nearest degree.

[3]

12.



Q is 150 km from P on a bearing of 037° .

R is 250 km due East of P .

R is on a bearing of 127° from Q .

- (a) Show that the interior angle $P\hat{Q}R$ is 90° .

[2]



- (b) State the bearing of P from Q . [1]
- (c) Calculate the distance QR . [3]
- (d) State the bearing of Q from R . [2]

13. A tech company employs 400 web designers.
One lead designer is employed to help ten web designers.
One supervisor is hired for every 20 lead designers.
- (a) Calculate the number of people employed in the company. [2]
- A web designer earns \$38 per hour for a 40 hour week.
- (b) Calculate the total wages of all the web designers for a week. [3]
- Each lead designer is paid \$2,250 per week.
- (c) Calculate their total wages for the week. [2]
- The total weekly wage package for this company is \$704,000.
- (d) Calculate the weekly pay for each supervisor. (Each is paid the same amount). [3]

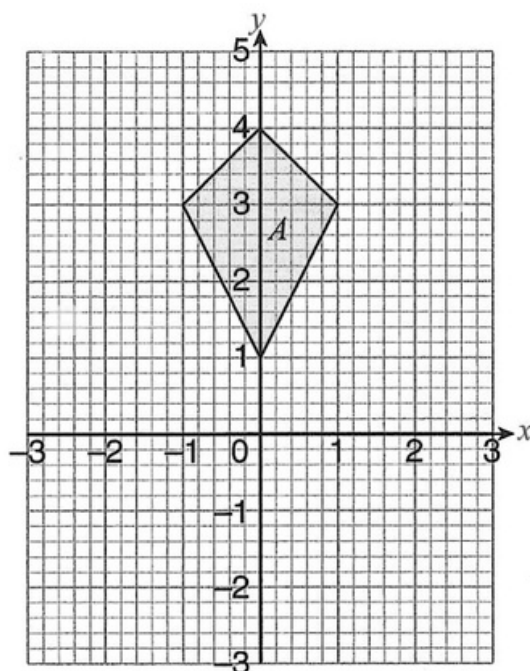
14. **ANSWER THIS ENTIRE QUESTION ON THE GRAPH PAPER PROVIDED.**

The table below gives values for the **two** given equations.

x	-6	0	2	6
$y = \frac{8-x}{2}$	7	4	b	1
$y = \frac{x+12}{2}$	a	6	7	9

- (a) Find the values of a and b . [2]
- (b) Using a scale of 1 cm to 1 unit on both axes, for $-8 \leq x \leq 8$ and $-2 \leq y \leq 10$, draw and label the graphs of the two equations. [5]
- (c) Write the coordinates of the point where the lines intersect. [1]
- (d) State the gradient of the line $y = \frac{8-x}{2}$. [1]

15. ANSWER THIS ENTIRE QUESTION ON THE GRAPH PAPER PROVIDED.



- (a) Using a scale of 1 cm to 1 unit on both axes, with $-8 \leq x \leq 8$ and $-5 \leq y \leq 13$, copy the diagram showing the kite A . [2]
- (b) Draw and label the following transformations:
- (i) Rotate A 180° about the origin. Label the image B . [2]
 - (ii) Reflect A in the line $x = -3$. Label the image C . [2]
 - (iii) Enlarge A by a scale factor of 3, with the centre the origin. Label the image D . [3]
 - (iv) Translate A with a displacement vector $\begin{pmatrix} 6 \\ 0 \end{pmatrix}$. Label the image E . [2]
- (c) Shape A can be reflected onto shape B . State the equation of the line of reflection. [1]

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