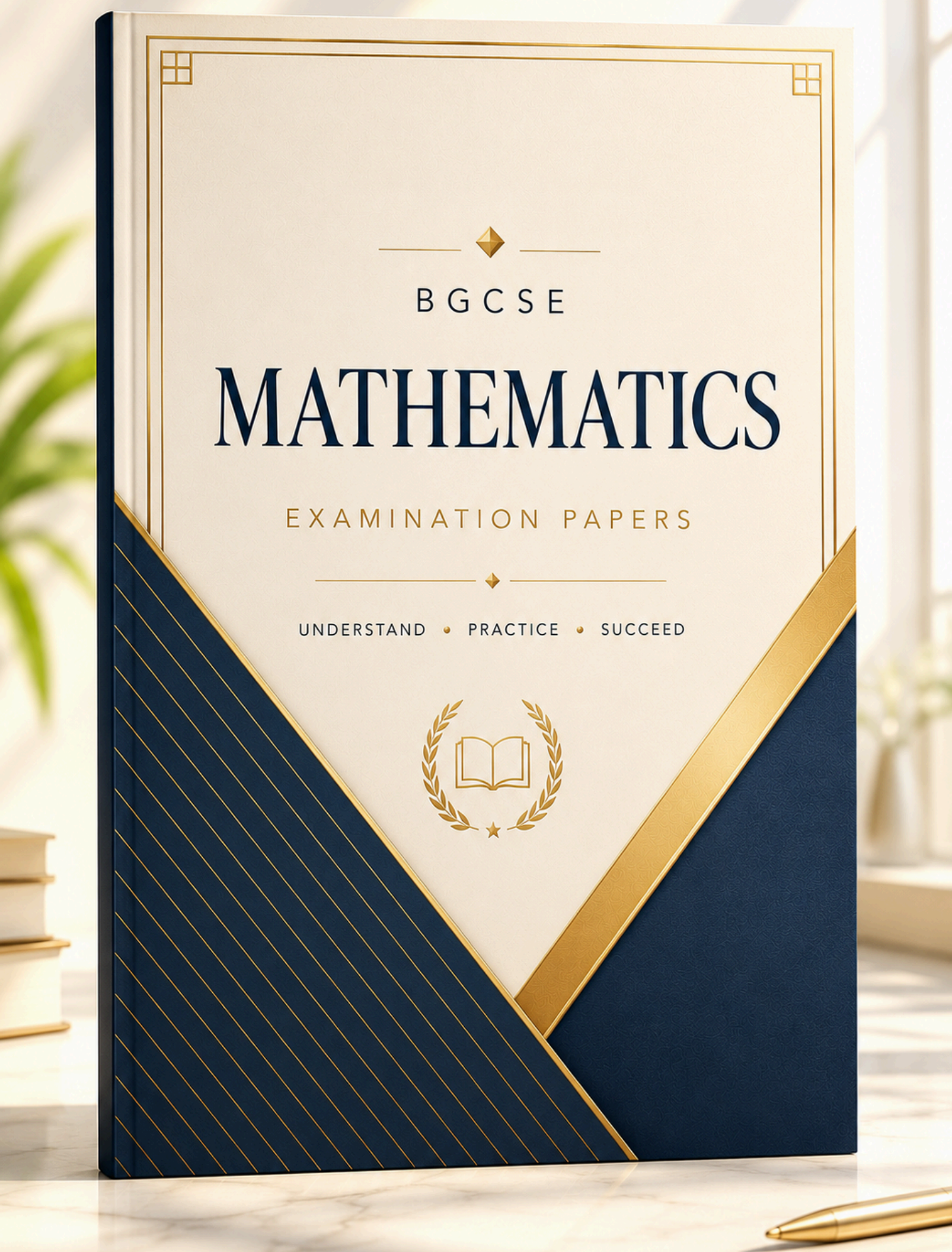
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3815/1 **BGCSE**

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MATHEMATICS

PAPER 1 (CORE/EXTENDED) 3815/1

Tuesday 21 MAY 2019 1:00 P.M.–2:30 P.M.

Additional materials:
Calculator (not graphing)
Geometrical instruments

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 at the top of this page.

Answer **ALL** questions in the spaces provided for each question.

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 **[NOT GRAPHING CALCULATORS]** may be used.

Tracing paper may be used.

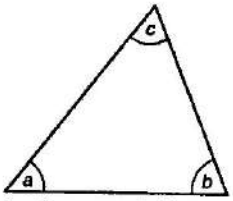
Geometrical instruments are required.

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

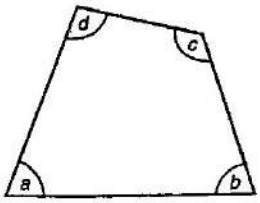
The total number of marks for this paper is 100.

This question paper consists of 12 printed pages and 0 blank pages.

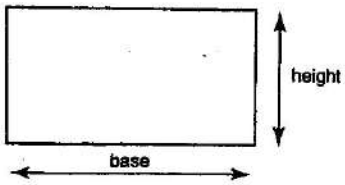
INFORMATION AND FORMULAE



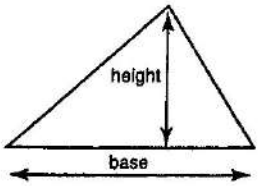
Angle sum of triangle
$a + b + c = 180°$



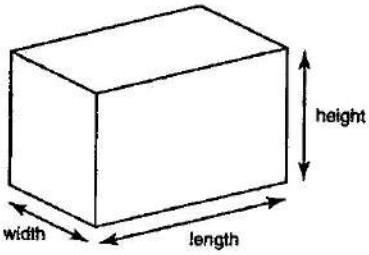
Angle sum of quadrilateral
$a + b + c + d = 360°$



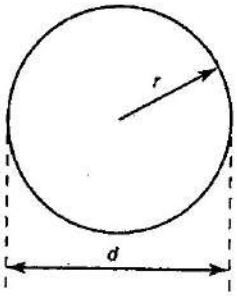
Area of rectangle = base × height



Area of triangle = $\frac{\text{base} \times \text{height}}{2}$



Volume of cuboid = length × width × height

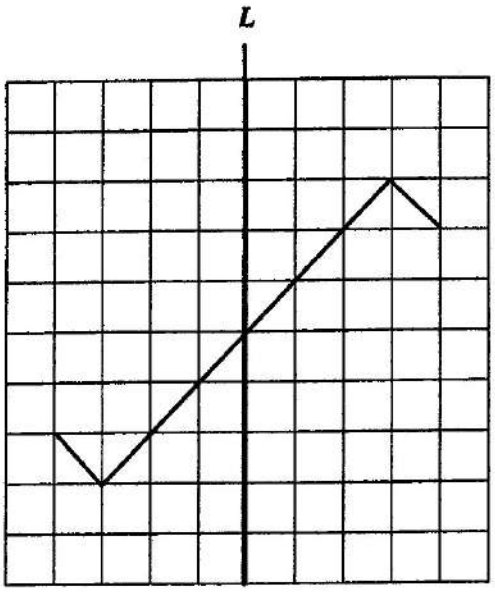


Circumference of circle = $2\pi r$ or πd
Area of circle = πr^2

1. Write down the next two numbers in the sequence

0, 1, 4, 9, ____, ____. [2]

2. Complete the diagram so that it is symmetrical about the line *L*.



[2]

3. Simplify

12+3(9−5)+6

Answer: _____ [3]

4. The shuttle bus leaves the hotel for the airport every 45 minutes.

A bus left the hotel at 10:40 a.m.

(a) Calculate the time when the next bus will leave.

Answer: _____ [2]

The 12:55 p.m. shuttle bus arrived at the airport at 1:22 p.m.

(b) Calculate the time taken for the journey.

Answer: _____ mins [2]

5. *PennyWise Store* has a sale on shampoo at 4 bottles for \$14.76.
SmartMart has a sale on the same shampoo at 2 bottles for \$11.37 then get one free.
Determine which store gives the better buy. Show your working to support your answer.

Answer: _____ [4]

---

6. Solve the following equations.

(a) $19q = 28 + 12q$

Answer: _____ [2]

(b) $\frac{2t}{3} = 14$

Answer: _____ [2]

7.

A triathlon includes swimming, long-distance running and cycling.
The distance for swimming is x miles.
The long-distance run is 11 times longer than the distance for swimming.
The distance for cycling is 85.8 miles longer than the distance for swimming.

Write an expression, in terms of x, for

(a) the distance run,

Answer: _____ [1]

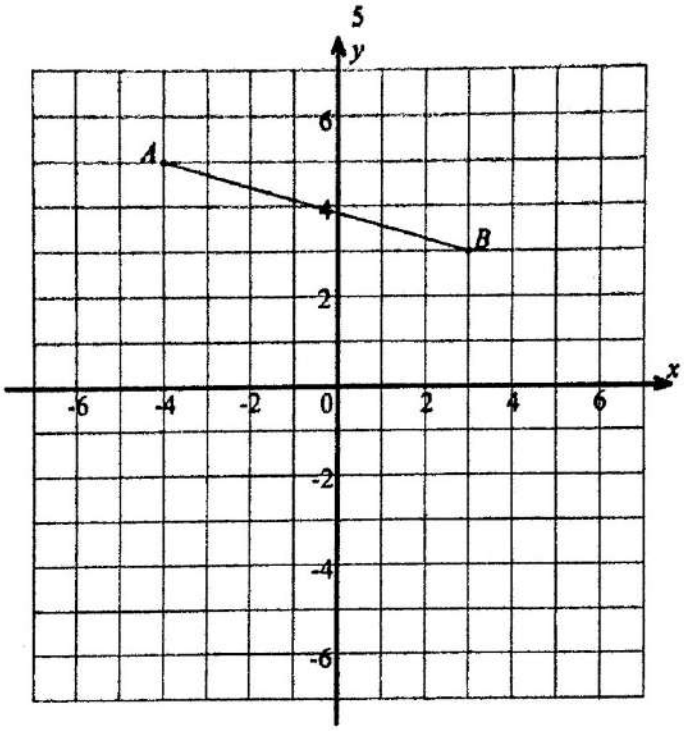
(b) the distance cycled,

Answer: _____ [1]

(c) the total distance of the triathlon, giving your answer in simplest form.

Answer: _____ [2]

8.



(a) Write down the coordinates of the point A.

Answer: _____ [1]

(b) Plot and label the point $C(1, -4)$. [1]

(c) Draw the line segment BC. [1]

(d) Plot and label the point D so that $ABCD$ forms a rectangle. [1]

---

9. 22.399, 22.99, 22.0999, 22.499, 22.909, 22.599

From the above list of numbers select and write down

(a) the largest number,

Answer: _____ [1]

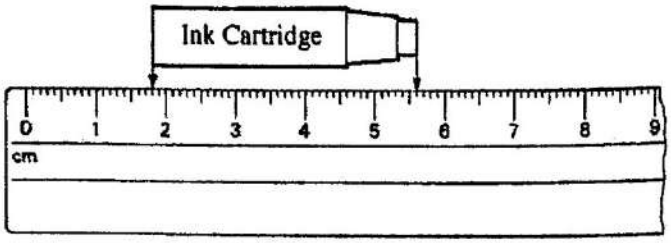
(b) the smallest number,

Answer: _____ [1]

(c) the numbers that are larger than $22\frac{1}{2}$.

Answer: _____ [2]

10.



(i) Use the ruler given to calculate the length, in centimetres, of the ink cartridge.

Answer: _____ [2]

(ii) Convert your measurement in (a) from

(iii) centimetres to millimetres,

Answer: _____ mm [1]

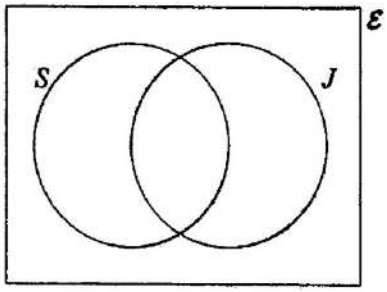
(iv) centimetres to metres.

Answer: _____ m [1]

---

11. Evan did a survey in his class on the TV programmes *Splashdown* (*S*) and *Jammin* (*J*). Fifteen students watch both programmes. Twenty-two watch *Splashdown*. Six watch *Jammin* only. There are 32 students in the class.

(a) Enter the above data in the Venn diagram below.



[4]

(b) Using the information in your Venn diagram, write down the number of students who watch

(i) only *Splashdown*,

Answer: _____ [1]

(ii) neither *Splashdown* nor *Jammin*.

Answer: _____ [1]

---

12. Alex has a collection of 180 baseball cards. In his collection, there are 72 cards of the Cougar team, 35% of the Lynx team and $\frac{1}{4}$ of the Panther team.

Calculate

(a) the fraction, in lowest terms, of his collection that are Cougar cards,

Answer: _____ [2]

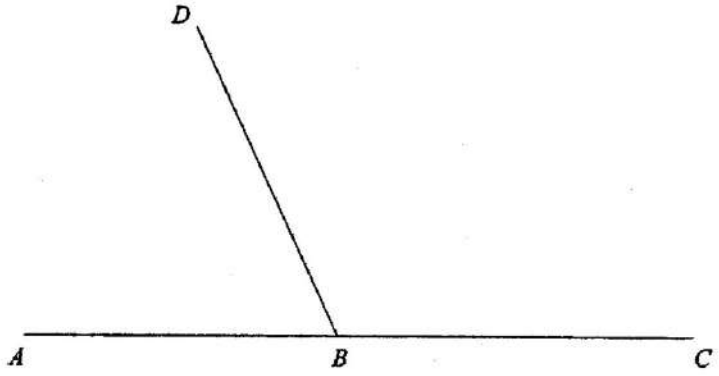
(b) the number of Lynx cards,

Answer: _____ [2]

(c) the number of Panther cards.

Answer: _____ [2]

13.



(a) Using a protractor, measure and write down the size of $\angle ABD$.

Answer: _____ [1]

(b) Leaving in ALL construction lines, use a pencil, ruler and a pair of compasses only to

(i) bisect the line segment BC, [2]

(ii) bisect ABD. [3]

14.

FlightCraft Inc. builds commercial aircraft. Their aircraft model FC1 has a seating arrangement with 6 rows of 4 seats across in first class and 28 rows of 6 seats across in economy class.

(a) Calculate the total number of passengers that the plane can carry.

Answer: _____ [3]

The aircraft model FC1 has the specifications given in the table below.

MODEL FC1	
Nonstop flight distance	5210 miles
Cruising speed	567 mph
Gallons of fuel used per hour	2031 gals.
Costs (to fly one hour):	
Crew	$1530
Fuel	$1716

(b) Calculate

(i) how many gallons of fuel are needed for a 4-hour flight,

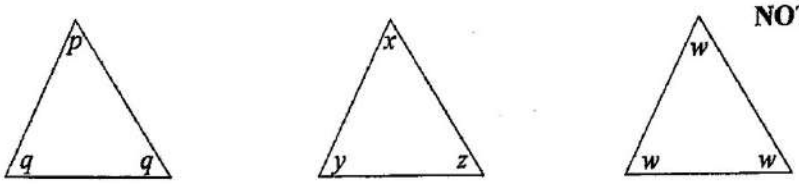
Answer: _____ [1]

(ii) the total cost for the crew and fuel for a 3-hour flight.

Answer: _____ [2]

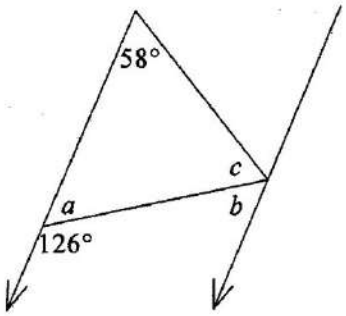
15. (a) Write down the special name of each triangle.

NOT TO SCALE



(i) _____ (ii) _____ (iii) _____ [3]

(b)



NOT TO SCALE

Calculate the size of

(i) angle *a*,

Answer: _____ [1]

(ii) angle *b*,

Answer: _____ [1]

(iii) angle *c*.

Answer: _____ [1]

16. From the set of numbers $\{2,\ 3^2,\ -8,\ 0,\ \sqrt{25},\ 16\}$ write down

(a) the numbers greater than 7,

Answer: _____ [2]

(b) the prime numbers,

Answer: _____ [2]

(c) the numbers less than 1.

Answer: _____ [2]

---

17. *Smartly Dressed* produces made-to-order school uniforms. The chart below shows the amount of fabric required for various size of shirts.

SHIRTS	
SIZE	AMOUNT OF FABRIC (yards)
Small	$1\frac{2}{3}$
Medium	$2\frac{1}{2}$
Large	$2\frac{5}{6}$

(a) Calculate

(i) the amount of fabric needed to make 9 large shirts,

Answer: _____ yds [2]

(ii) the number of small shirts that can be produced from $18\frac{1}{3}$ yards of fabric.

Answer: _____ [2]

Mrs. Jones orders one small and two medium shirts.

(b) Calculate the amount of fabric required.

Answer: _____ yds [3]

---

18. Simplify

(a) $8-3(5-2y)$

Answer: _____ [3]

(b) $3p \times 2p^3 \times 5$

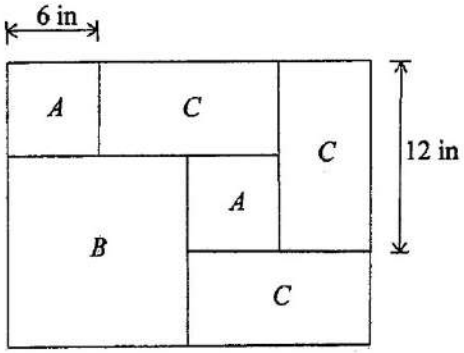
Answer: _____ [2]

(c) $24q^7 \div 3q^3$

Answer: _____ [2]

---

19. Mr. Jones tiles his foyer with three different size tiles: square tiles *A* and *B* and rectangular tiles *C*. This gives a basic pattern as shown below.



Calculate

(a) the area of tile *A*,

Answer: _____ square ins [1]

(b) the area of tile *B*,

Answer: _____ square ins [2]

(c) the area of tile *C*,

Answer: _____ square ins [2]

(d) the area of the entire pattern.

Answer: _____ square ins [2]

---

20. Jeff wants to buy a drone for his photography project. The cash price is $1294.00.

VAT is added at the rate of 7.5%.

(a) Calculate

(i) the VAT amount,

Answer: _____ [2]

(ii) the total cost of the drone.

Answer: _____ [2]

Jeff decides to buy the drone on a hire purchase plan at a total cost of $1593.00, with monthly payments spread over $\frac{1}{2}$ a year.

(b) Calculate

(i) the amount of each monthly payment,

Answer: _____ [2]

(ii) the amount which can be saved if he had paid cash.

Answer: _____ [2]

MATHEMATICS

PAPER 2 (CORE/EXTENDED) 3815/2

Wednesday 22 MAY 2019 9:00A.M.–11:00A.M.

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

MINISTRY OF EDUCATION
NATIONAL EXAMINATIONS

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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 each 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

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Tracing paper may be used.

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

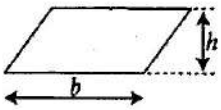
The total number of marks for this paper is 100.

This question paper consists of 10 printed pages and 2 blank pages.

INFORMATION AND FORMULAE

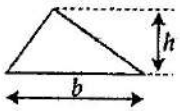
MENSURATION

Parallelogram



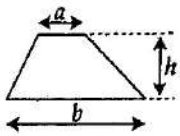
Area = bh

Triangle



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

Trapezium



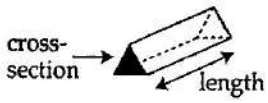
Area = $\frac{1}{2}(a+b)h$

Circle (radius r, diameter d)
Circumference = $2\pi r$ or πd
Area = πr^2

Cylinder (radius r, height h)
Volume = $\pi r^2 h$

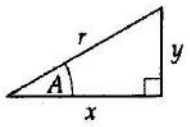
Prism
Volume = area of cross-section × length

e.g. triangular prism

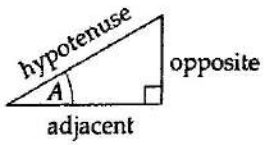


TRIGONOMETRY

Right-angled triangle



$r^2 = x^2 + y^2$, (result of Pythagoras)



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

NUMBER

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

1. Express this ratio in simplest form.

   $600\,m : 1.5\,km$ [2]

---

2. A whole number, n, is rounded off to one significant figure to give 400.

   Write down

   (a) the smallest whole number that n could be, [1]

   (b) the largest whole number that n could be. [1]

---

3. Express the following inequality statements algebraically:

   (a) w is more than 37, [1]

   (b) x is smaller than twice y, [1]

   (c) z is at least 23. [1]

---

4. A Hi-speed usb has a download rate of 3.84×10^9 bits per second. 1 byte = 8 bits.

   Calculate the download rate in bytes per second. Give your answer in scientific notation (standard form). [3]

---

5. A tourist visited The Bahamas when the exchange rate was €1 Euro = $1.36 Bahamian. Upon arrival, she converted €640 into Bahamian dollars.

   (a) Calculate the amount of Bahamian dollars received. [2]

   At the end of her vacation she converted her remaining $102 Bahamian back to Euros.

   (b) Calculate the amount of Euros received. [2]

6. Two numbers a and b are such that $a > b$. Their sum is 59.

(a) Write down an equation to represent this information. [1]

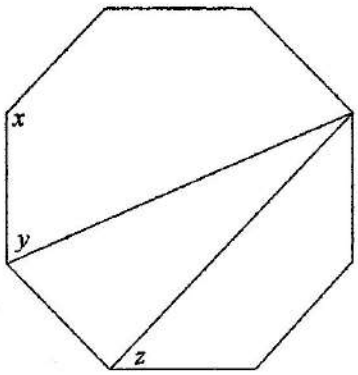
Their difference is 17.

(b) Write down an equation to represent this information. [1]

(c) Solve your simultaneous equations to find the numbers a and b. [3]

---

7. The polygon below represents a regular octagon.



NOT TO SCALE

Calculate the following angles. You must show your working.

(a) x [2]

(b) y [1]

(c) z [2]

---

8. In the first eight days of the month of May, the rainfall was

15 mm, 5 mm, 0 mm, 11 mm, 5 mm, 6 mm, 15 mm, 5 mm.

For the first eight days of May,

(a) write down the modal rainfall, [1]

(b) calculate the mean daily rainfall, [2]

(c) calculate the median rainfall. [2]

It did not rain on any of the other days of the month of May.

(d) Calculate the mean daily rainfall for the entire month of May. [1]

---

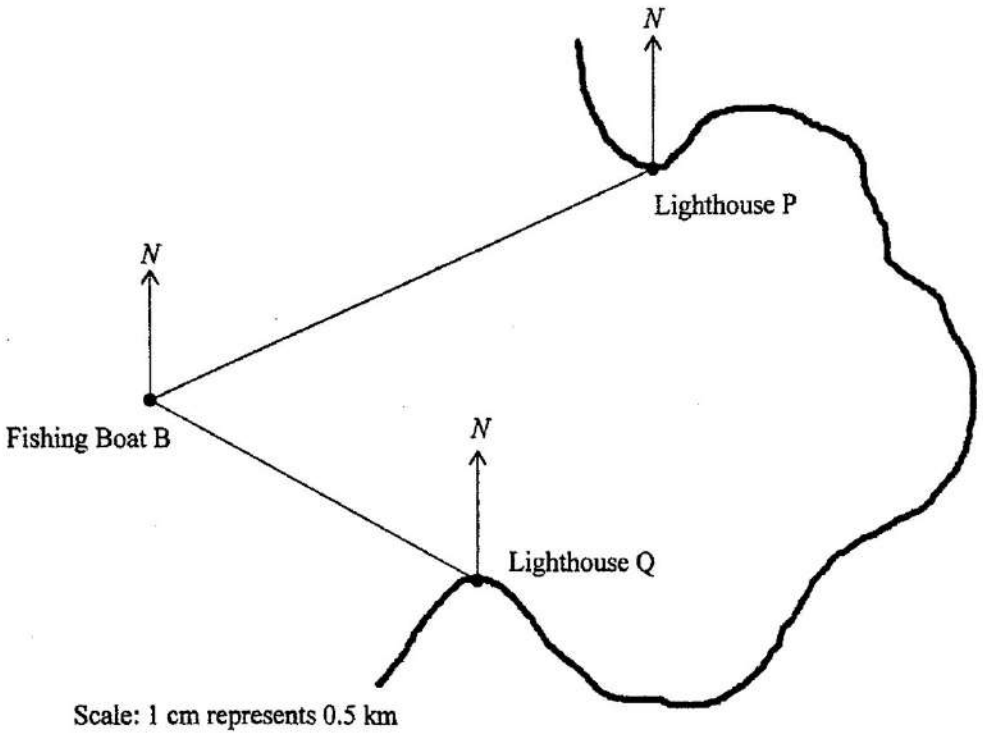
9. For the formula $A = P(1 + rt)$, calculate the value of

(a) (i) A, when $P = 1200$, $r = 0.075$ and $t = 3$, [2]

(ii) P, when $A = 2100$, $r = 0.08$ and $t = 5$. [2]

(b) Make t the subject of the formula. [3]

10. The diagram is a **scale drawing** showing the position of a Fishing Boat B and Lighthouses P and Q onshore.



(a) Calculate the shortest distance (in km) between Lighthouse P and Lighthouse Q. [2]

(b) Measure the bearing of Lighthouse P from the Fishing Boat B. [1]

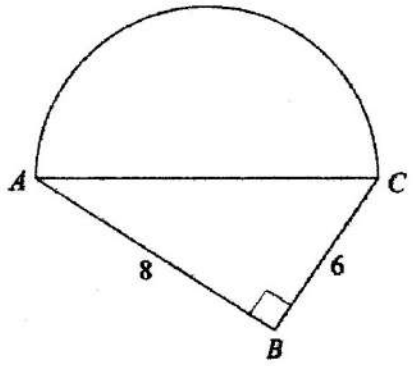
(c) Calculate the bearing of the Fishing Boat B from Lighthouse Q. [2]

Another fishing boat sails west a distance of 5.8 km from Lighthouse P.

(d) Calculate the length west from Lighthouse P that this would be on the scale drawing. [2]

11. The template below consists of a semicircle and a right-angled triangle.

$AB = 8$, $BC = 6$ and $\angle ABC = 90°$.



Calculate, using $\pi = 3.142$ **where necessary,**

(a) the length of the diameter AC, [2]

(b) the area of the triangle ABC, [2]

(c) the area of the semicircle, [3]

(d) the total area of the template. [1]

---

12. Going home from school, Jerry takes a bus journey of 7.2 km. The bus travels at an average speed of 36 km/h.

(a) Calculate the time taken for the bus journey. [2]

He then walks the remaining 1.2 km to his home in 20 minutes.

(b) Calculate his average walking speed in km/h. [3]

(c) Calculate Jerry's average speed for the entire journey from school to his home. [3]

---

13. (a) Factorise completely

$$12xy^2 + 18x^2y - 6y$$ [3]

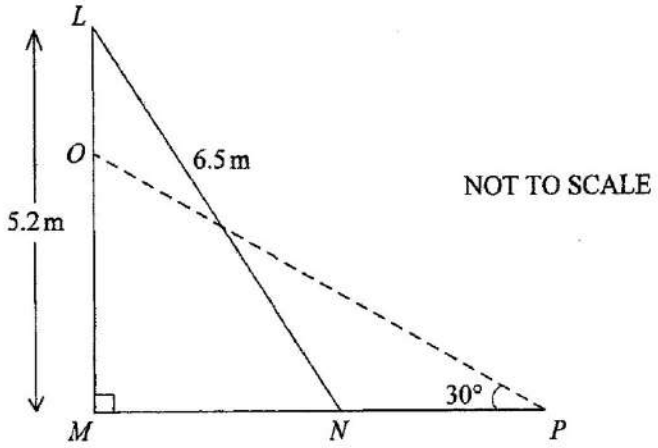
(b) Simplify

(i) $5 + 3(2 - 7z) + 4z$ [3]

(ii) $\frac{3t}{4} - \frac{2t}{5}$ [3]

---

14. A ladder LN, 6.5 m long, leans against a wall. The foot of the ladder is on the same horizontal level as the base of the wall. The top of the ladder just reaches the top of the wall, LM, which is 5.2 m high.



(a) Calculate

(i) the distance MN between the base of the wall and the foot of the ladder, [3]

(ii) the angle $\angle MLN$ between the wall and the ladder. [3]

The ladder slips down the side of the wall, forming a new angle of elevation with the ground, $\angle OPN = 30°$.

(b) Calculate the height OM. [3]

---

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

(a) Copy and complete the following table for the graph of $y = \frac{6-2x}{3}$.

x	–6	–1.5	0	3	9
y	6		2	0	

[2]

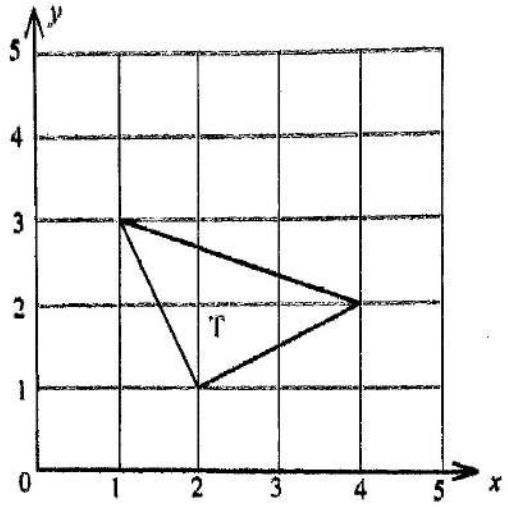
(b) Using a scale of 1 cm to 1 unit for each axis, and values $-7 \leq x \leq 10$ and $-7 \leq y \leq 10$, draw the graph of the line $y = \frac{6-2x}{3}$. [3]

(c) Calculate the gradient (slope) of your graph in (b). [2]

(d) Another graph has the y-intercept -4 and the gradient $\frac{1}{3}$. Draw this graph on the same coordinate plane. [3]

(e) Write down the coordinates of the point where the lines intersect. [1]

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



(a) Using a scale of 1 cm to represent 1 unit on each axis, taking values of x from $-8 \leq x \leq 10$, and values of y from $-8 \leq y \leq 10$, copy and draw the above triangle T. [3]

(b) Draw the image of triangle T after a rotation of 180° about the origin. Label it B. [2]

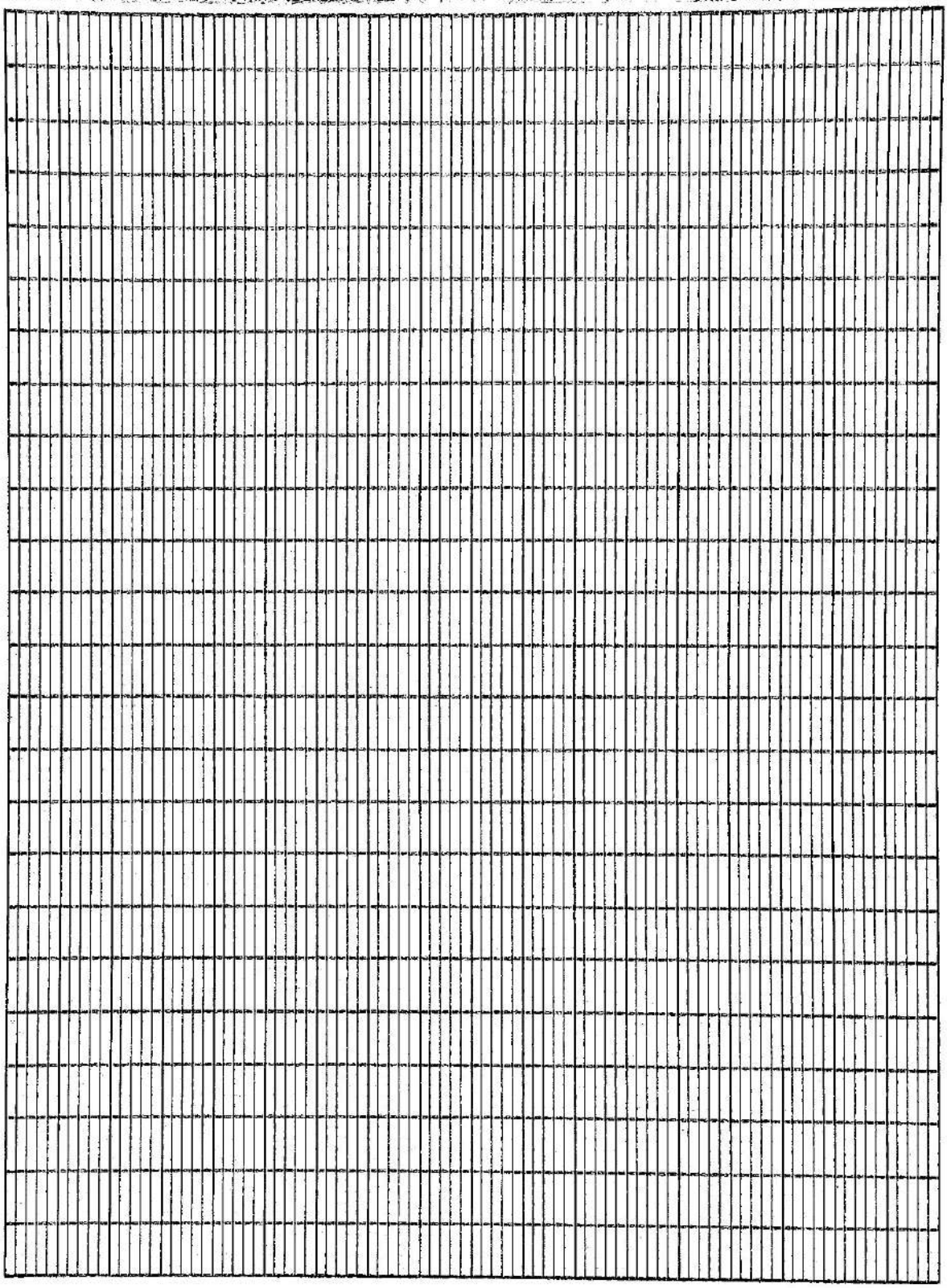
(c) Translate triangle T by $\begin{pmatrix} 1 \\ -5 \end{pmatrix}$. Label the image C. [2]

(d) Reflect triangle T in the line $x = -1$. Label the image D. [2]

(e) Enlarge triangle T by a scale factor of 2 through the origin. Label the image E. [2]

EXAMINATION

School No.	Candidate No.	Level:	For Examiner's Use
Subject Number & Title:		Paper:	
Surname & Initials:		Section:	
Signature:	Date:	Qu. No.	



MATHEMATICS

PAPER 3 (CORE/EXTENDED) 3815/3

Monday 27 MAY 2019 9:00A.M.–11:30A.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 each 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 may be used.

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

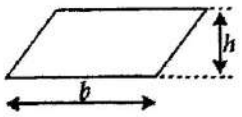
The total number of marks for this paper is 100.

This question paper consists of 9 printed pages and 3 blank pages.

INFORMATION AND FORMULAE

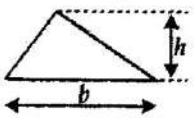
MENSURATION

Parallelogram



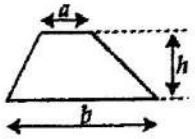
Area = bh

Triangle



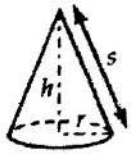
Area = $\frac{1}{2}bh$

Trapezium



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

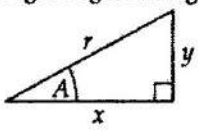
Cone



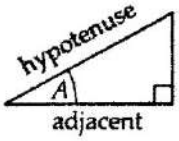
Circle (radius r, diameter d)	Circumference	$= 2\pi r$ or πd
	Area	$= \pi r^2$
Cylinder (radius r, height h)	Volume	$= \pi r^2 h$
	Area of curved surface	$= 2\pi rh$
Sphere (radius r)	Volume	$= \frac{4}{3}\pi r^3$
	Area of surface	$= 4\pi r^2$
Prism	Volume	= area of cross-section × length
Pyramid	Volume	$= \frac{1}{3}$ × area of base × height
Cone (radius r, height h)	Volume	$= \frac{1}{3}\pi r^2 h$
	Area of curved surface	$= \pi rs$ where s = slant height $\sqrt{h^2 + r^2}$

TRIGONOMETRY

Right-angled triangle

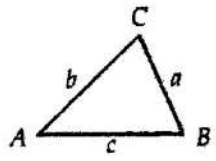


$r^2 = x^2 + y^2$ (result of Pythagoras)



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

Any triangle



In any triangle ABC: $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

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

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

Area of triangle $ABC = \frac{1}{2}ab\sin C$

NUMBER

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

ALGEBRA

The quadratic equation $ax^2 + bx + c = 0$ has solutions

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

The determinant of matrix $\begin{pmatrix} a & b \\ c & d \end{pmatrix}$ is $ad - bc$.

The inverse of $\begin{pmatrix} a & b \\ c & d \end{pmatrix}$ is $\dfrac{1}{ad-bc}\begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$

If $y = ax^n$, then $\dfrac{dy}{dx} = anx^{n-1}$

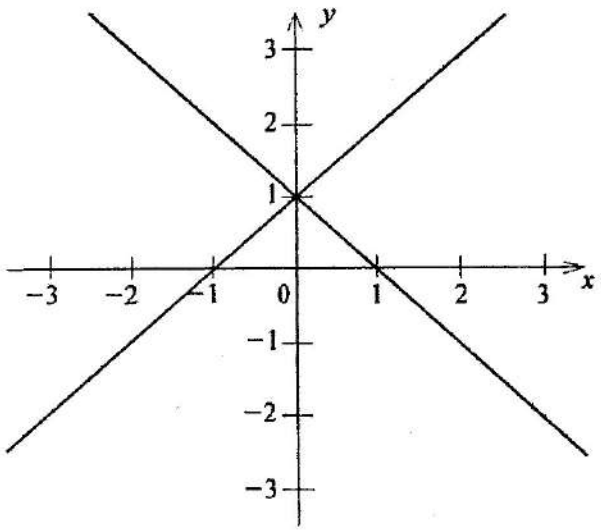
1. For an isosceles triangle, one of the angles is 66°. Calculate the possible values of the other two angles. [2]

---

2. (a) The matrix A is of order 3×2 and the matrix B is of order 2×1. Write down the order of the resultant matrix AB. [1]

(b) $\begin{pmatrix} 5 & 0 \\ -1 & 1 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix}=\begin{pmatrix} 10 \\ 5 \end{pmatrix}$. Calculate the values of x and y. [3]

3.



The diagram shows the graph of the two lines $y = x + 1$ and $y = 1 - x$.

(a) **Sketch** a copy of the diagram and label the graph of each line with its correct equation. [2]

(b) On your diagram, shade the region for which the following three inequalities are satisfied.

$$\begin{cases} y \geq 0 \\ y \leq x + 1 \\ y \geq 1 - x \end{cases}$$ [3]

---

4. (a) Factorise completely

$$p^2 - pq - pr + qr$$ [3]

(b) Solve for x

$$\frac{5x-7}{3} = \frac{x}{2}$$ [3]

---

5. (a) Write as a single fraction in simplest form

$$\frac{5}{x+3} - \frac{2}{x-1}$$ [3]

(b) Factorise and simplify

$$\frac{3y-12}{y^2-16}$$ [3]

---

6. Every time Eddy shoots a free throw in a basketball game, the probability that he will score a point is 0.8.

When he shoots two free throws, calculate the probability that he

(a) scores both, [1]

(b) misses both, [2]

(c) scores one and misses one. [3]

---

7. The sum of the first n natural numbers is given by the formula

$$S = \frac{n(n+1)}{2}$$

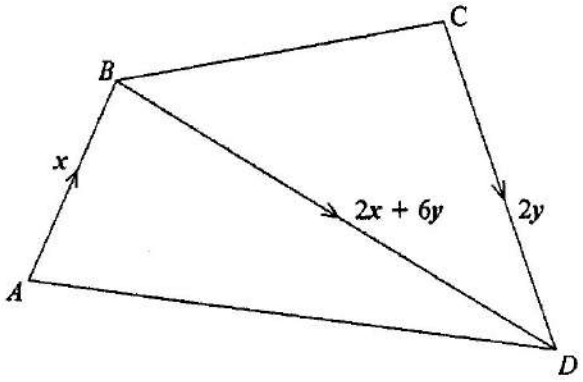
Use the formula to calculate

(a) the sum of the first 50 natural numbers, [2]

(b) the amount of natural numbers that add up to 210. [5]

---

8. In the diagram, $\overrightarrow{AB} = x$, $\overrightarrow{BD} = 2x + 6y$, and $\overrightarrow{CD} = 2y$.



NOT TO SCALE

(a) Express in terms of x and y in simplest form

(i) $\overrightarrow{AD}$, [3]

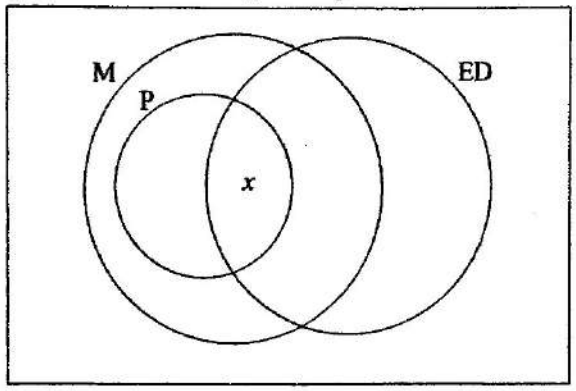
(ii) $\overrightarrow{BC}$. [3]

(b) Write **two** geometrical properties of $\overrightarrow{AD}$ and $\overrightarrow{BC}$. [2]

9. At the college this semester, there are 85 students enrolled in the Electrical Engineering Programme. The Venn diagram shows three of the courses the students may register for.

40 take Physics (P).
All Physics student take Mathematics (M).
44 take Electrical Drawing (ED).
14 take Mathematics only.
6 take Mathematics and Electrical Drawing only.
5 take none of the three.

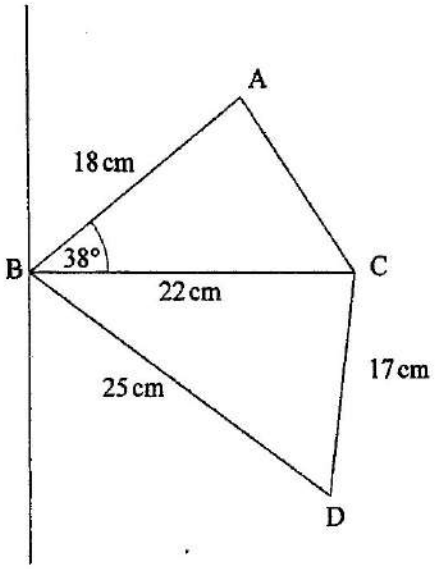
Electrical Engineering Students



(a) Copy and complete the Venn diagram, in terms of x where applicable. [5]

(b) Write an equation in terms of x, then solve for x. [3]

10.



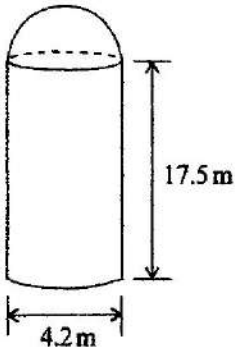
NOT TO SCALE

(a) Calculate the area of triangle ABC. [3]

(b) Calculate the size of angle DBC. Give your answer to one decimal place. [5]

(c) Calculate the shortest distance from C to the line BD. [4]

11. The diagram shows a silo that consists of a cylinder topped by a hemisphere. The height of the cylinder is 17.5 m and the diameter is 4.2 m.



Using $\pi = \frac{22}{7}$, calculate

(a) the maximum volume of the silo, ignoring the thickness of the material used to make the silo, [5]

(b) the total surface area of the silo. [5]

A small scale model of the silo is made on a scale of 1:20

(c) Calculate the total surface area of the model. [2]

12. The functions f, g and h are defined as follows:

$$f: x \to 7 - x$$
$$g: x \to x^2$$
$$h: x \to 5^x$$

(a) Calculate the value of

(i) $f(-3)$, [1]

(ii) $g\left(\frac{1}{3}\right)$, [1]

(iii) $h(-1)$ [1]

(b) Calculate the value of x for which

(i) $f(x) = 15$ [1]

(ii) $g(x) = 36$ [2]

(iii) $h(x) = 125$ [2]

(c) Determine expressions for

(i) $hf: x \to$, [1]

(ii) $gh: x \to$, [2]

(iii) f^{-1}, the inverse of the function f. [1]

---

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

(a) Copy and complete the following table for the graph of $y = 30x - x^2$.

x	0	5	10	15	20	25	30
y	0		200		200	125	0

[2]

(b) Using a scale of 2 cm to 5 units on the x-axis for $0 \le x \le 40$ and 2 cm to 50 units on the y-axis for $0 \le y \le 300$, draw the graph of $y = 30x - x^2$. [4]

(c) Use your graph to solve the equation $x^2 - 30x + 100 = 0$. [3]

(d) Calculate the gradient of the curve at the point (10, 200). [3]

End