MINISTRY OF EDUCATION AND HUMAN RESOURCES,
TERTIARY EDUCATION AND SCIENTIFIC RESEARCH
MAURITIUS EXAMINATIONS SYNDICATE

Let the mind manage the body
Que l'esprit gère le corps

NATIONAL ASSESSMENT AT FORM III

NAME	
SCHOOL NAME	
CLASS/SECTION	

MATHEMATICS

October 2016
1 hour 45 minutes

Students answer on the Question Paper.

READ THESE INSTRUCTIONS FIRST

Answer **all** questions.

Write your name, the name of your school and your class/section in the spaces provided above.
Write in dark blue or black ink.
You may use a soft pencil for any diagram or rough working.
Do not use correction fluid.

There are **19** questions in this paper.
Check that this document consists of **23** printed pages and **1** blank page.
Any discrepancy in the document must be immediately notified to the responsible officer in your school.

If working is needed for any question it must be shown in the space below that question.
Omission of essential working may result in loss of marks.
Diagrams are **not** drawn to scale.

ELECTRONIC CALCULATORS MUST NOT BE USED IN THIS PAPER

The number of marks is given in brackets [ ] at the end of each question or part question.
The total number of marks for this paper is **100**.

1. Evaluate

(a) 10 + 2 x 3

Answer ……..... [1]

(b) $\sqrt[3]{27}$

Answer ……..... [1]

2. **(a)** Write down the next term in the sequence

12, 15, 18, 21, …….

Answer ……..... [1]

(b) Write down 4.86 correct to 1 decimal place.

Answer ……..... [1]

(c) Express 300 grams in kilograms.

Answer …… kg [1]

3. **(a)** Evaluate $\frac{3}{4} + \frac{1}{6}$, giving your answer as a fraction in its lowest terms.

Answer ……..……. [1]

(b) Express 30 cm as a percentage of 2 m.

Answer ……..…..……..…% [1]

(c) Calculate 20% of 70.

Answer ……..……..…… [1]

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4. **(a)** Simplify

(i) $a^7 \div a^2$

Answer ..... [1]

(ii) $(x^2)^3$

Answer ..... [1]

(b) Evaluate $2^2 + 2^3$

Answer ..... [1]

5. **(a)** Given that **A** = $\begin{pmatrix} 2 & 1 \\ 3 & 5 \end{pmatrix}$ and **B** = $\begin{pmatrix} 1 & 4 \\ 6 & 9 \end{pmatrix}$, find **2A – B**.

Answer ……..…… [2]

(b) Work out

$$\begin{pmatrix} 3 & 1 & 7 \end{pmatrix} \begin{pmatrix} 6 & 2 \\ 4 & 5 \\ 2 & 1 \end{pmatrix}$$

Answer ……..…… [2]

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6. **(a)** Given that $a = 4$ and $b = -3$, find the value of $5a - 2b$.

Answer ……..…… [1]

(b) Factorise

(i) $3x^2 + 5x$

Answer ……..…….…… [1]

(ii) $y^2 - 25$

Answer ……..…….. [1]

7. **(a)** A fair cubical die is thrown.

What is the probability of obtaining a score greater than 4?

Answer …….. [1]

(b) $A = \{4, 5, 7, 9\}$ and $B = \{2, 5, 6, 7, 9\}$

(i) List the elements of $A \cup B$.

Answer {……..……..} [1]

(ii) Find n($A \cap B$)

Answer …….. [1]

Please turn over this page

8. **(a)** Expand and simplify

(i) $(2x + 3)(x + 5)$

Answer …..……..…..…….. [2]

(ii) $(y - 6)^2$

Answer …..……..…….. [2]

(b) Given that $q = 3m - 2p$, express m in terms of p and q.

Answer: m = ……..……... [2]

9. **(a)** Given that vector $\overrightarrow{AB} = \begin{pmatrix} 4 \\ 3 \end{pmatrix}$, find

(i) $\overrightarrow{BA}$

Answer ……[1]

(ii) $\left|\overrightarrow{AB}\right|$

Answer …… units [2]

(b) Tom sold his mobile phone for Rs 6300 and made a profit of 5%.

At what price did Tom buy the mobile phone?

Answer: Rs ……[3]

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10. **(a)** Solve the equations

(i) $8 - 3(x + 4) = 2x + 1$

Answer: x = ……..……..……..…… [3]

(ii) $\frac{x}{2} = \frac{8}{x}$

Answer: x = ……. or x = ……..… [3]

(b) Solve the inequality

$-2x + 5 < 9$

Answer ……..…… [3]

11. **(a)** The radius of a circle is 8 cm.

Calculate the circumference of the circle.

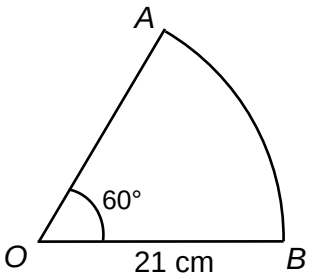
[**Use $\pi = 3.14$**]

Answer ……..….. cm [1]

(b) The diagram shows sector *OAB* of a circle with centre O and radius 21 cm.

Given that $A\hat{O}B$ = 60°, calculate the area of sector *OAB*.

[**Use $\pi = \frac{22}{7}$**]



Answer ……..…… cm^2 [2]

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12. Solve the simultaneous equations

$$4x + 5y = 25$$

$$3x - 2y = 13$$

Answer: x = ……..

y = …….. [4]

13. A straight line passes through the points (2, 1) and (6, 9).

(a) Calculate the gradient of the line.

Answer …… [2]

(b) Find the equation of the line.

Answer ……..…… [2]

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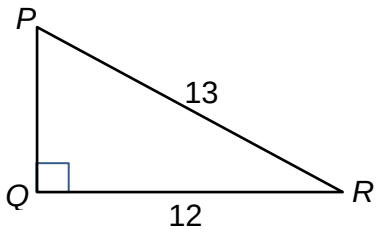
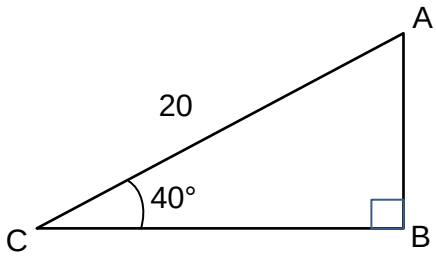
14. **(a)** In triangle PQR, PR = 13 cm, QR = 12 cm and $P\hat{Q}R = 90°$



Using Pythagoras' theorem, calculate the length of PQ.

Answer: PQ = ……..… cm [2]

(b) In triangle ABC, AC = 20 cm, $A\hat{B}C = 90°$ and $A\hat{C}B = 40°$



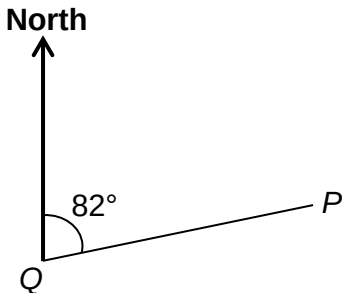
[sin 40° = 0.643, cos 40° = 0.766, tan 40° = 0.839]

Using as much of the given information as necessary, calculate the length of BC.

Answer: BC = ……..… cm [3]

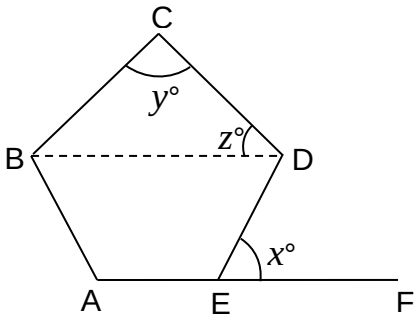
15. **(a)** The bearing of *P* from *Q* is 082°.

Calculate the bearing of *Q* from *P*.



Answer ……..…… [2]

(b) In the diagram, *ABCDE* is a **regular** pentagon. *AEF* and *BD* are straight lines.



Find

(i) angle x

Answer: Angle x = ……..… [2]

(ii) angle y

Answer: Angle y = ……..… [2]

(iii) angle z

Answer: Angle z = ……..… [2]

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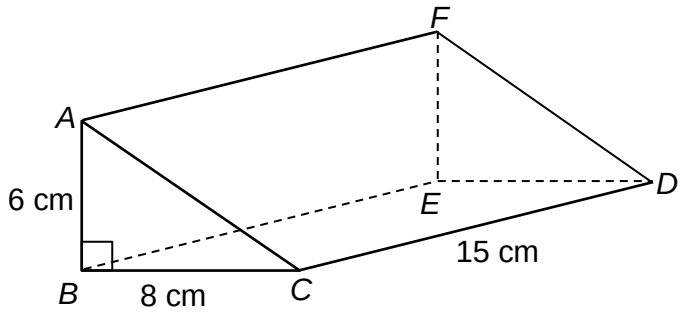
16. **(a)** The diagram shows a triangular prism, *ABCDEF*.
AB = 6 cm, BC = 8 cm and CD = 15 cm.
$A\hat{B}C = 90°$.



(i) Find the area of the triangle *ABC*.

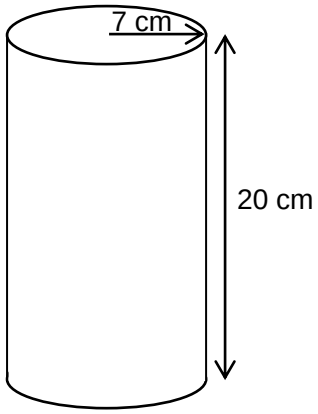
Answer ..... cm^2 [1]

(ii) Calculate the volume of the prism.

Answer ..... cm^3 [2]

(b) A cylinder, **open at one end**, has radius 7 cm and height 20 cm. Calculate the total surface area of the cylinder.

[**Use** $\boldsymbol{\pi = \frac{22}{7}}$]



Answer …… cm^2 [3]

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17. **(a)** A cubical die was thrown 20 times. The table shows the number of times that each score occurred.

Score	1	2	3	4	5	6
Frequency	2	6	4	1	2	5

For the above distribution, find the

(i) mode

Answer ……..…… [1]

(ii) mean

Answer ……..…… [3]

(iii) median

Answer ……..…… [3]

(b) A rectangular container is $\frac{2}{5}$ full of water. If $3\frac{1}{2}$ litres of water are poured into the container, it will be $\frac{3}{4}$ full.

What is the capacity of the container?

Answer ..... litres [4]

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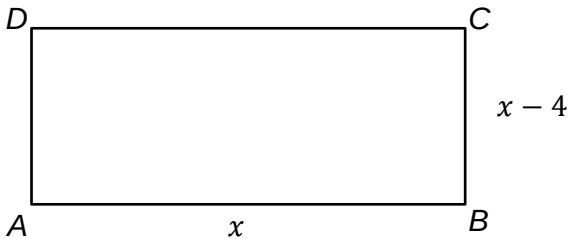
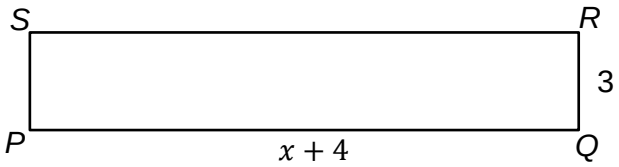
18. *ABCD* is a rectangle with $AB = x$ cm and $BC = (x - 4)$ cm.



(a) Write down an expression, in terms of x, for the area of rectangle *ABCD*.

Answer ……..…….……. cm^2 [1]

PQRS is a rectangle with $PQ = (x + 4)$ cm and $QR = 3$ cm.



(b) Write down an expression, in terms of x, for the area of rectangle *PQRS*.

Answer ……..…….……. cm^2 [1]

The area of rectangle *ABCD* is **twice** the area of rectangle of *PQRS*.

(c) Form an equation in x and show that it simplifies to

$$x^2 - 10x - 24 = 0$$

[2]

(d) Solve the equation $x^2 - 10x - 24 = 0$

Answer: x = …..… or x = ..…..… [3]

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19. In a party, 300 cm^3 of a fruit cocktail are served to each of the 200 persons present.

(a) How many litres of fruit cocktail are served?

[1 litre = 1000 cm^3]

Answer ……..…… litres [2]

(b) The fruit cocktail was prepared by mixing apple juice and orange juice in the ratio 2 : 3.

Calculate the number of litres needed for **each** type of juice to prepare the fruit cocktail for the 200 persons.

Answer ……..… litres of apple juice

……..…… litres of orange juice [3]

(c) A **total** amount of Rs 3780 is spent to buy the apple juice and the orange juice. The amount spent on the orange juice is Rs 900 **more** than the amount spent on the apple juice.

What is the cost of **one** litre of orange juice?

Answer: Rs……..…… [5]

End of question paper.

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