



MINISTRY OF EDUCATION AND HUMAN RESOURCES
MAURITIUS EXAMINATIONS SYNDICATE

NATIONAL ASSESSMENT AT FORM III

NAME

SCHOOL
NAME

CLASS/SECTION

MATHEMATICS

OCTOBER 2013

1 hour 45 minutes

Students answer on the Question Paper.

READ THESE INSTRUCTIONS FIRST

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 **18** questions in this paper.

Answer **all** questions.

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, unless specified otherwise in a particular question or part question.

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) $\sqrt{36}$,

Answer [1]

(b) $12 + 8 \div 4$,

Answer [1]

(c) $9.45 - 3.82$.

Answer [1]

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

6, 12, 24, 48,

Answer [1]

(b) Convert 7.5 metres into centimetres.

Answer cm [1]

(c) Write down 6.387 correct to two decimal places.

Answer[1]

3. (a) A cake costs Rs 12. What is the cost of 20 such cakes?

Answer Rs [1]

(b) Express $\frac{1}{5}$ as a decimal.

Answer [1]

(c) Find the value of $2\frac{2}{5} \times \frac{10}{27}$, giving your answer as a fraction in its lowest terms.

Answer [1]

4. Simplify

(a) $a^4 \times a^7$,

Answer [1]

(b) $x^{10} \div x^6$,

Answer [1]

(c) $(y^3)^4$.

Answer [1]

5. Given that $\mathbf{A} = \begin{pmatrix} 5 & 3 \\ 2 & 4 \end{pmatrix}$ and $\mathbf{B} = \begin{pmatrix} 2 & 1 \\ 7 & 6 \end{pmatrix}$, find

(a) $2\mathbf{A} + 3\mathbf{B}$,

Answer [2]

(b) \mathbf{AB} .

Answer [2]

6. (a) Given that $a = -9$ and $b = -5$, find the value of $3a - 4b$.

Answer [2]

(b) Expand and simplify $(3x - 5)^2$.

Answer [2]

(c) Factorise

(i) $y^2 + 5y$,

Answer [1]

(ii) $m^2 - 9$.

Answer [1]

7. (a) In a box there are 4 red balls, 6 blue balls and 7 yellow balls. A ball is drawn at random from the box.

Giving your answer as a fraction, find the probability that the ball is

(i) red,

Answer [1]

(ii) not blue.

Answer [1]

(b) Given $\xi = \{a, b, c, d, e, f, g, h\}$, $P = \{c, d, e, h\}$ and $Q = \{a, c, e, g, h\}$,

(i) list the elements of $P \cap Q$,

Answer[1]

(ii) find $n(Q')$.

Answer[1]

8. Solve the simultaneous equations

$$2x + 5y = 31 ,$$

$$3x + 4y = 36 .$$

Answer $x = \dots\dots\dots$

$y = \dots\dots\dots$ [4]

9. A cubical die was thrown 50 times. The table shows the number of times that each score occurred.

Score	1	2	3	4	5	6
Frequency	5	7	6	7	15	10

For the above distribution, find the

- (a) mode,

Answer [1]

- (b) mean,

Answer [3]

- (c) median.

Answer [3]

10. (a) Solve the equation $\frac{3x-2}{6} = \frac{4x+1}{5}$.

Answer $x = \dots\dots\dots$ [3]

(b) Solve the inequality $5 - 3x > 23$.

Answer $\dots\dots\dots$ [3]

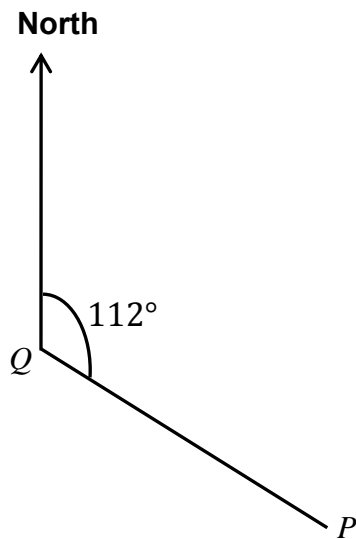
(c) Given that $p = 7x + 4q$, express x in terms of p and q .

Answer $\dots\dots\dots$ [2]

11. (a) Find the equation of the straight line passing through the points $A(2, 5)$ and $B(4, 11)$.

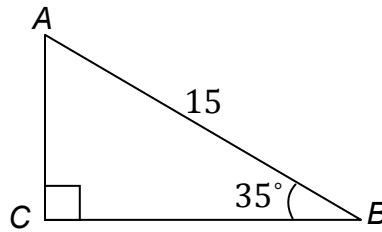
Answer [3]

- (b) The bearing of P from Q is 112° .
Calculate the bearing of Q from P .



Answer [2]

12. (a) In the triangle ABC , $\hat{A}BC = 35^\circ$, $\hat{A}CB = 90^\circ$ and $AB = 15$ cm.



$[\sin 35^\circ = 0.574, \cos 35^\circ = 0.819, \tan 35^\circ = 0.700]$

Using as much of the information as necessary, calculate the length of AC .

Answer cm [3]

(b) Given that vector $\overrightarrow{PQ} = \begin{pmatrix} 8 \\ -6 \end{pmatrix}$, find

(i) \overrightarrow{QP} ,

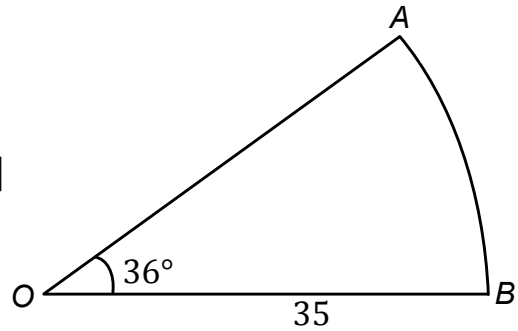
Answer [1]

(ii) $|\overrightarrow{PQ}|$.

Answer [2]

13. (a) The diagram shows sector OAB of a circle with centre O and radius 35 cm.
 Given that $\hat{AOB} = 36^\circ$, calculate

- (i) the length of arc AB . [$\pi = \frac{22}{7}$]



Answercm [2]

- (ii) the area of sector OAB . [$\pi = \frac{22}{7}$]

Answercm² [2]

- (b) Each of the exterior angles of a **regular** polygon is 30° .
 Calculate the number of sides in the polygon.

Answer [2]

14. (a) Find the highest common factor (H.C.F.) of 16 and 24.

Answer [1]

(b) Three bells ring at intervals of 15, 30 and 45 minutes respectively.
They ring together at 08 40.

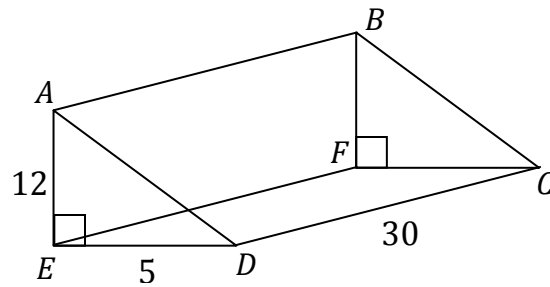
At what time will they next ring together?

Answer [4]

(c) A gardener plants 30 trees in a straight line. The trees are 10 m apart.
What is the distance between the first tree and the last tree?

Answer m [2]

15. The diagram shows a **solid** prism $ABCDEF$ with $AE = BF = 12$ cm,
 $ED = FC = 5$ cm, $DC = EF = AB = 30$ cm and $\hat{AED} = \hat{BFC} = 90^\circ$.



- (a) Using Pythagoras' theorem, calculate the length of AD .

Answer cm [2]

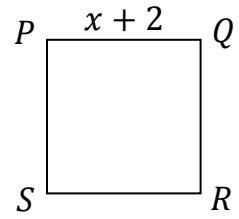
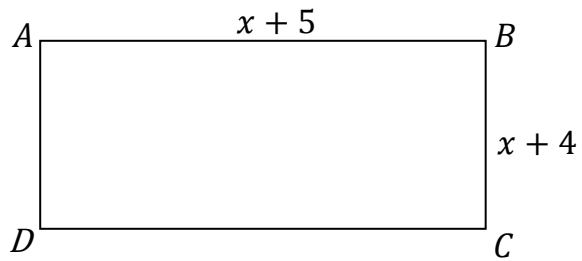
- (b) Find the area of the triangle ADE .

Answer cm^2 [2]

(c) Calculate the total surface area of the solid prism.

Answer cm^2 [3]

16. $ABCD$ is a rectangle with $AB = (x + 5)$ cm and $BC = (x + 4)$ cm.
 $PQRS$ is a square with $PQ = (x + 2)$ cm.



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

- (a) Form an equation in x and show that it simplifies to $x^2 - x - 12 = 0$. [5]

(b) Solve the equation $x^2 - x - 12 = 0$.

Answer $x = \dots\dots\dots$ or $\dots\dots\dots$ [3]

(c) Hence, find the length of AB .

Answer $\dots\dots\dots$ cm [1]

17. The number of listeners of a radio station in 2010 was 150 000.

- (a) In 2011, the number of listeners increased to 180 000.
Calculate the percentage increase.

Answer % [2]

Each year, the radio station invites its listeners to vote for their favourite programme.

- (b) In 2010, 60% of the listeners voted.

Calculate the number of listeners who voted in 2010.

Answer [2]

(c) In 2012, the number of listeners was 250 000 and 200 000 of them voted.

(i) Calculate the percentage of listeners who voted in 2012.

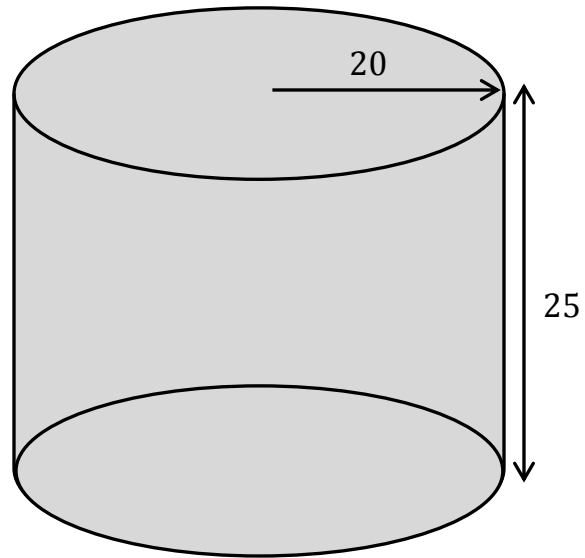
Answer% [2]

(ii) The number of listeners who voted in 2012 was 25% more than the number of listeners who voted in 2011.

Calculate the number of listeners who voted in 2011.

Answer [3]

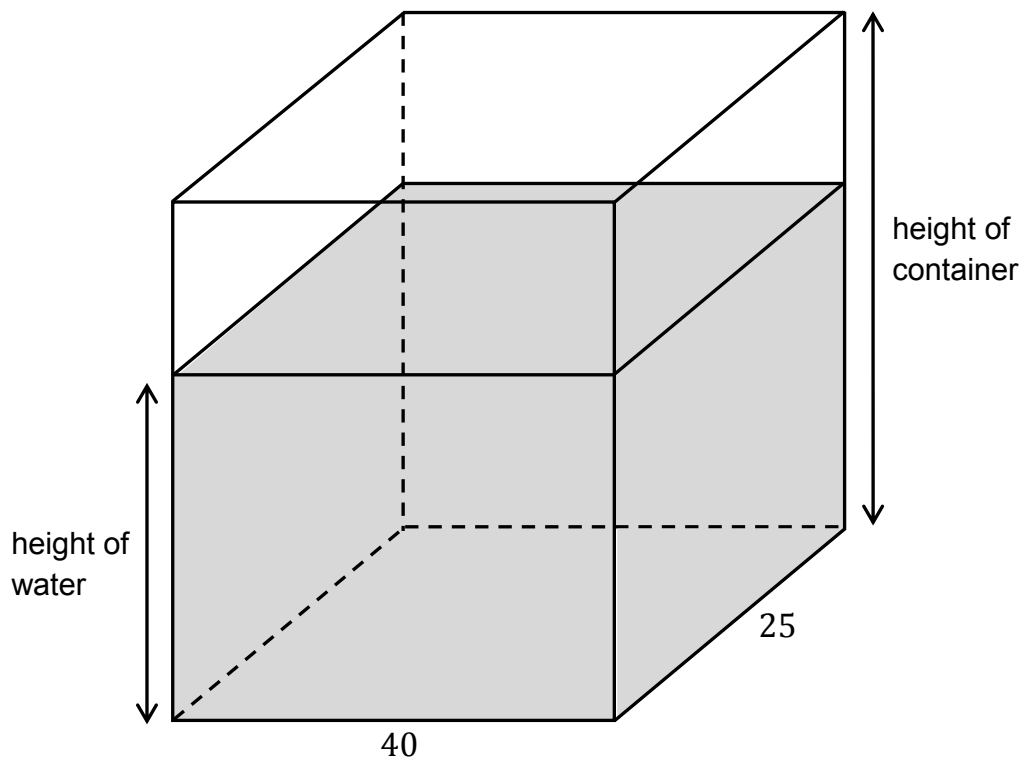
18. A cylindrical container **A** has radius 20 cm and height 25 cm. It is completely filled with water as shown below.



Container **A**

A rectangular container **B** has length 40 cm and width 25 cm. Initially the container **B** was empty.

All the water from container **A** is poured into container **B** (see diagram below).



Container **B**

The ratio of the height of water to the height of container **B** is 2 : 3 .

Find the height of container **B**.

[Use $\pi = 3.14$ in this question]

Answer cm [6]

End of Question Paper