

EXTERNAL ASSESSMENT PROJECT

YEAR 11 Mathematics

TEST INSTRUCTIONS

Answering the questions

Please make sure that you have a separate answer sheet with this test paper.

Please write your name and the subject in the boxes provided on your answer sheet.

Please check that your test paper colour matches the colour of the label on your answer sheet.

This test has **50 QUESTIONS**. Each question has four possible answers. Only one is correct.

Please use a pencil only to shade in the answer bubble of your choice on your answer sheet.

Choose the correct answer from **A, B, C or D** and colour this bubble in on your **MATHEMATICS ANSWER SHEET**.

If you make a mistake then rub out your answer completely and colour in the bubble of your new answer.

All answers must be marked on your **ANSWER SHEET**.

You are allowed **1 hour and 20 minutes** for this test.

MAY 2008

1 $\frac{1}{5} + \frac{x}{10} =$

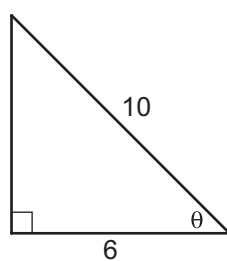
A $\frac{1+x}{10}$

B $\frac{2+x}{10}$

C $\frac{1+x}{15}$

D $\frac{10+x}{50}$

2 Amal correctly calculated the size of angle θ using trigonometry.



Her first line of working was which one of the following?

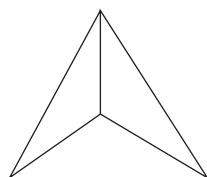
A $\cos \theta = \frac{6}{10}$

B $\cos \theta = \frac{8}{10}$

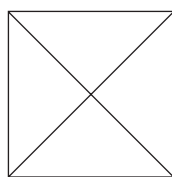
C $\sin \theta = \frac{6}{10}$

D $\sin \theta = \frac{10}{6}$

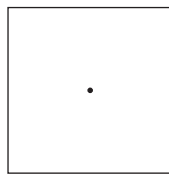
3 Which one of the following is the top view of a square pyramid?



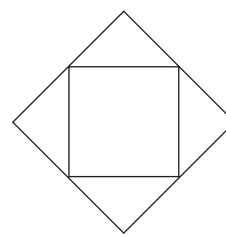
A



B



C



D

- 4** Ali swam x laps of the school swimming pool.
Abdullah swam three laps more than Ali.
In total, they swam 11 laps.
Which equation represents this situation?

A $x + 3 = 11$
B $x - 3 = 11$
C $2x + 3 = 11$
D $2x - 3 = 11$

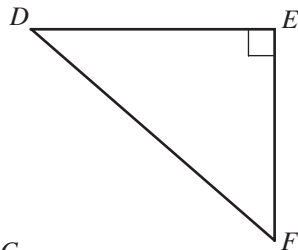
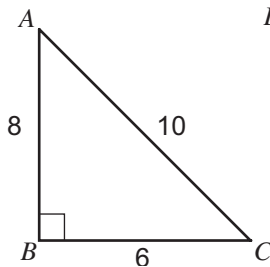
- 5** The number of hours each student spent on homework was investigated in a class.
The results are shown in the stem and leaf plot.

0		3	5	7	9	
1		0	1	2	6	7
2		1	2			

How many students are in the class?

A 3
B 11
C 14
D 133

6



Triangle ABC is similar to triangle DEF.
The sides of DEF are three times as long as the corresponding sides of ABC.

What is the length of side EF?

A 2
B 6
C 8
D 18

- 7** Three boys and two girls are each given a five dirham note and a ten dirham note by their teacher. The total amount the teacher pays out to the group is given by:

A $(3 + 2)(5 + 10)$
B $(3 + 5)(2 + 10)$
C $(3 + 10)(5 + 2)$
D $(3 + 2) + (5 + 10)$

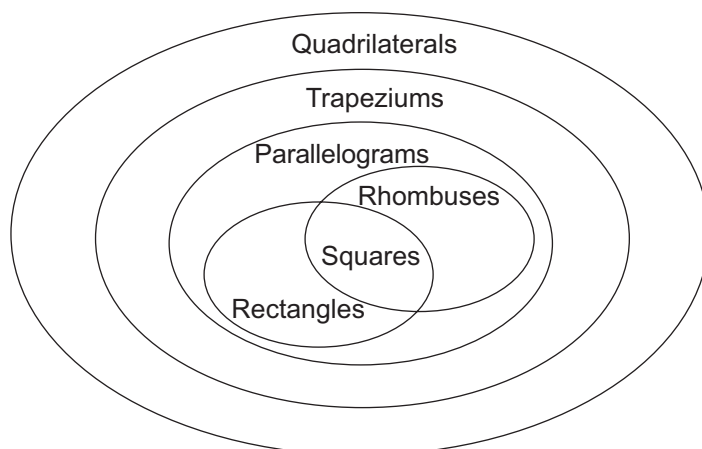
- 8 The ages of overseas visitors were recorded at an airport. The results are shown below.

Age	Frequency
1 - 19	200
20 - 38	320
39 - 57	140
Total	660

Which calculation would be used to determine the mean age?

- A $\frac{(1 \times 200) + (30 \times 20) + (39 \times 140)}{660}$
- B $\frac{(10 \times 200) + (29 \times 320) + (48 \times 140)}{660}$
- C $\frac{(19 \times 200) + (38 \times 320) + (57 \times 140)}{660}$
- D $\frac{(20 \times 200) + (58 \times 320) + (96 \times 140)}{660}$

- 9 Consider the relationships presented in the following Venn diagram.



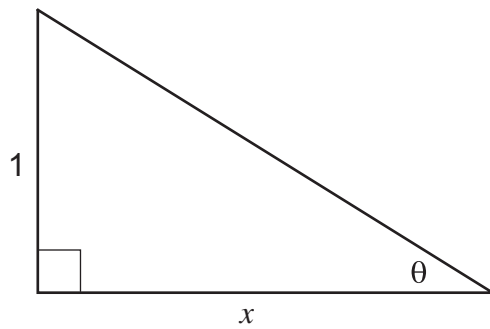
Which one of the following relationship statements is **not** true?

- A A rectangle is a special type of parallelogram.
- B A rhombus is a special type of quadrilateral.
- C A rectangle is a special type of square.
- D A square is a special type of rectangle.

- 10 Which one of the following is equivalent to a^3 ?

- A $3a$
- B $a \times a \times a$
- C $a + a + a$
- D $3a \times 3a \times 3a$

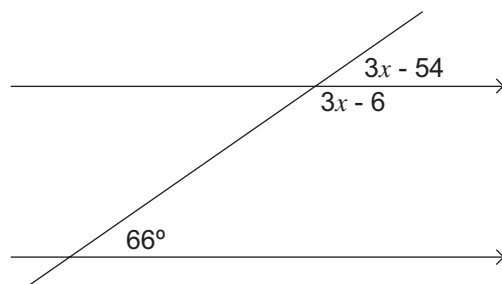
- 11** In the triangle below, which is not drawn to scale, it is known that $\tan \theta = \frac{3}{4}$.



What is the value of x ?

- A** $\frac{3}{4}$
- B** $\frac{4}{3}$
- C** 3
- D** 4

12



Which one of the following equations could be used to find the value of x ?

- A** $3x - 6 = 66$
- B** $3x - 6 = 114$
- C** $3x - 6 = 180$
- D** $3x - 6 = 3x - 54$

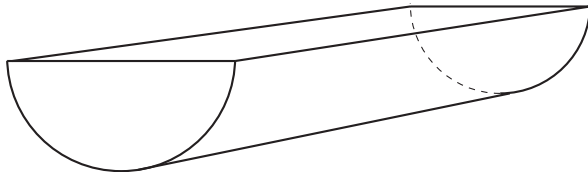
- 13** Which one of the following is correct?

- A** $\sqrt{1} + \sqrt{1} = \sqrt{2}$
- B** $\sqrt{4} + \sqrt{5} = \sqrt{9}$
- C** $\sqrt{1} + \sqrt{2} = \sqrt{3}$
- D** None of the above

14 Expand $-5(3x + 1)$

- A** $-8x - 5$
- B** $-15x - 6$
- C** $-15x + 5$
- D** $-15x - 5$

15 Half a cylindrical drum is filled with soil and used to grow tomatoes.



The diameter of the drum is 60 cm, and it is 1 m long.
The amount of soil it contains is which one of the following?

- A** $\frac{1}{2} \times 60^2 \times 100 \times \pi$ mL
- B** $\frac{1}{2} \times 30^2 \times 1 \times \pi$ mL
- C** $\frac{1}{2} \times 60^2 \times 1 \times \pi$ mL
- D** $\frac{1}{2} \times 30^2 \times 100 \times \pi$ mL

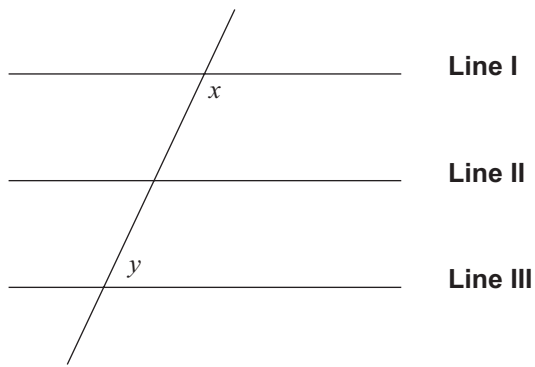
16 Which of the following is **not** a property of a parallelogram?

- A** Adjacent sides are equal.
- B** Diagonals bisect each other.
- C** Opposite angles are equal.
- D** Opposite sides are parallel.

17 A triangular shade sail has an area of 20 m^2 .
How many square centimetres is this?

- A** 100
- B** 400
- C** 2000
- D** 200 000

- 18** Consider the following diagram which is not drawn to scale.

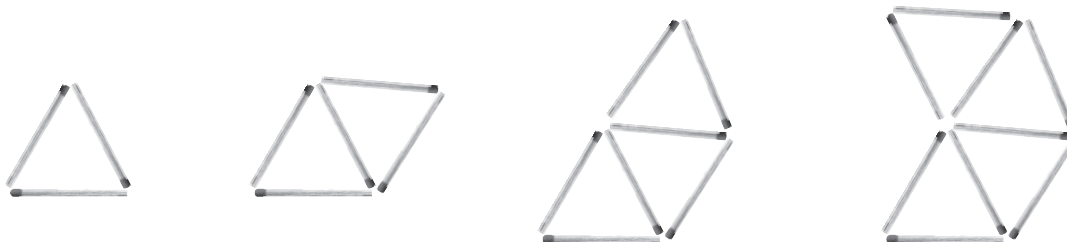


If $x + y = 180^\circ$, then which lines **must** be parallel?

- A** I and II
 - B** II and III
 - C** I and III
 - D** I, II and III
-
- 19** Khalid sold a graphics calculator to Yahya for 450 Dhs. This was 50 Dhs less than Khalid had paid for it. Yahya later sold it and made a profit of 10%. Compared with what Khalid had paid originally, Yahya's selling price could be described as which of the following?

- A** 1% less
 - B** 1% more
 - C** 10% less
 - D** equal
-

- 20** A number of matches, M , is used to produce a 2-D figure made from a certain number of triangles, T .



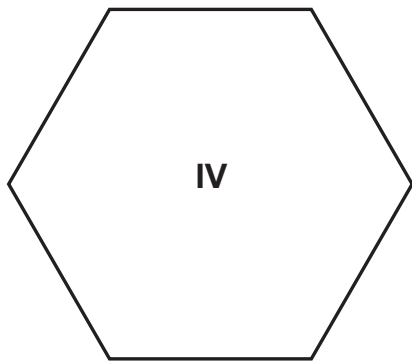
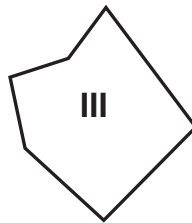
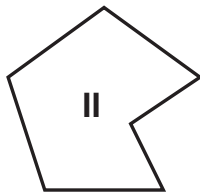
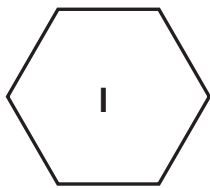
Which rule describes the pattern shown?

- A** $M = 2T$
- B** $M = 3T$
- C** $M = 2T + 1$
- D** $M = 4T - 1$

- 21** The circular surface of a swimming pool has an area of 64π square metres. How far is it to swim across the pool at its widest point?

A 6 m
B 8 m
C 16 m
D 32 m

- 22** Two of the figures below are congruent. Which two figures are congruent?

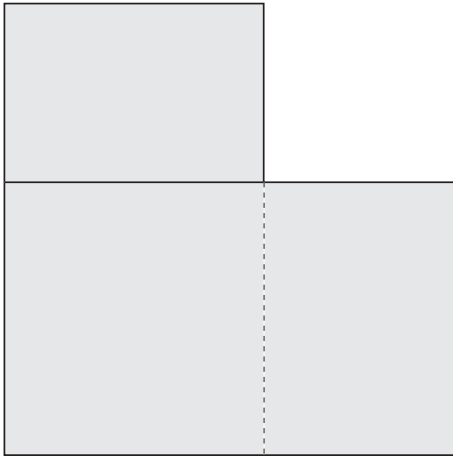


A I and IV
B I and V
C II and III
D III and IV

- 23** My CD player can take two discs at a time. The number of pairs of CDs I can select from my favourite n CDs is given by $\frac{n(n-1)}{2}$. If there are 15 possible pairings, then what is the number (n) of my favourite CDs?

A 5
B 6
C 15
D 105

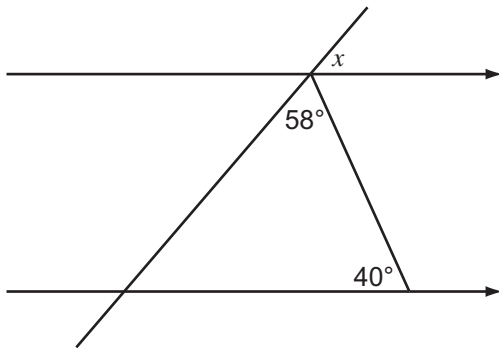
- 24** Two rectangles each measuring 8 cm by 5 cm overlap each other as shown. The diagram is not to scale.



What is the area of the figure?

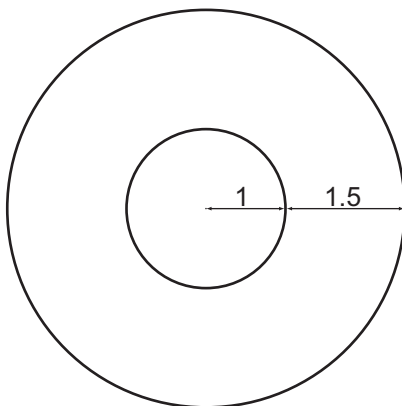
- A** 64 cm^2
- B** 55 cm^2
- C** 40 cm^2
- D** 25 cm^2

- 25** Calculate the value of x in the following diagram. The diagram is not drawn to scale.



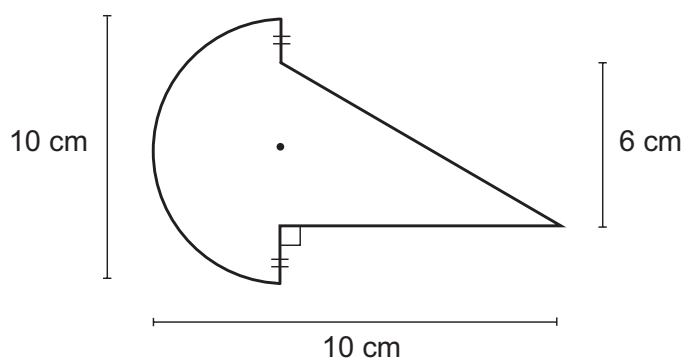
- A** 40°
- B** 58°
- C** 82°
- D** 98°

- 26** What is the ratio of the circumference of the inner circle to that of the outer circle?



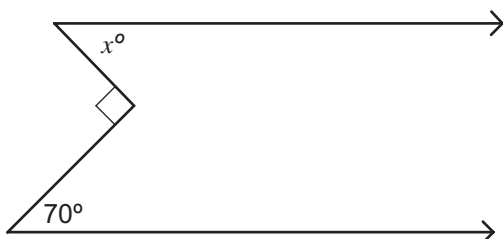
- A** 5:2
- B** 2:5
- C** 1:3
- D** 1:5

- 27** Find the area of this figure.



- A** $\frac{1}{2}\pi \times 25 + 15$
B $\frac{1}{2}\pi \times 25 + 30$
C $\frac{1}{2}\pi \times 10 + 15$
D $\frac{1}{2}\pi \times 10 + 30$

28



The value of x is which one of the following?

- A** 20
B 30
C 70
D 110

- 29** What is the value of $5x^0 - 2$?

- A** -1
B -2
C 3
D 4

- 30** Consider the following system of equations in x and y .

$$ax + by = m$$

$$cx + dy = n$$

A graphical solution showed two lines intersecting at the point $(4, 3)$, and nowhere else. The number of solutions to the system is

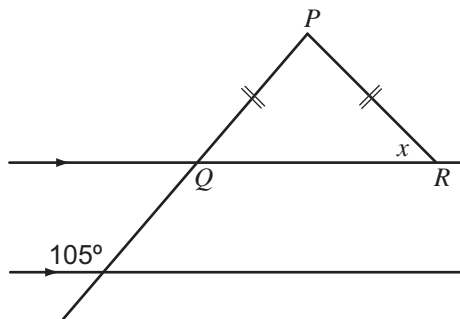
- A** 1
B 2
C 7
D $m + n$

- 31** Sana buys and sells baseball cards. She aims to make an average profit of Dhs 50 per month. She made a loss of Dhs 20 the first month. She lost Dhs 10 the second month.

What profit does Sana need to make in the third month to achieve her aim?

- A** Dhs 20
- B** Dhs 70
- C** Dhs 90
- D** Dhs 180

- 32** Triangle PQR is isosceles. The diagram is not to scale.



The value of x is

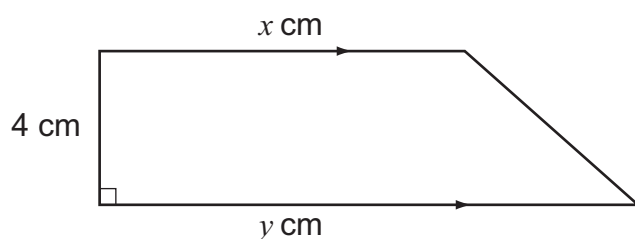
- A** 37.5°
- B** 52.5°
- C** 75°
- D** 105°

- 33** Abdul was asked to choose a number, then double it, and then add ten. Instead, Abdul subtracted ten from his chosen number, and then doubled his answer. The result Abdul obtained was 30.

What should he have obtained?

- A** 20
- B** 60
- C** 90
- D** 150

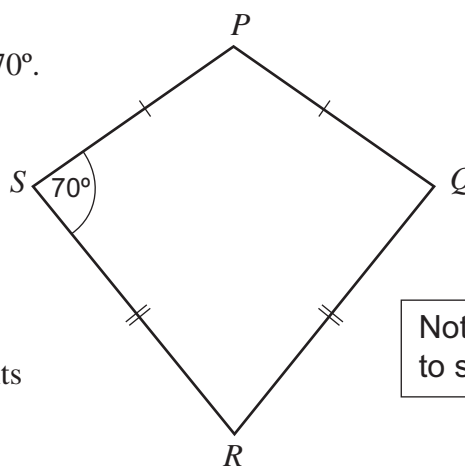
- 34** The area of the trapezium below is 24 cm^2 .



Which one of the following shows possible values of x and y ?

- A** $x = -3$ and $y = 15$
- B** $x = 2$ and $y = 6$
- C** $x = 3$ and $y = 4$
- D** $x = 3$ and $y = 9$

- 35** $PQRS$ is a quadrilateral as shown.
 $PS = PQ$ and $SR = QR$ and $\angle S$ measures 70° .

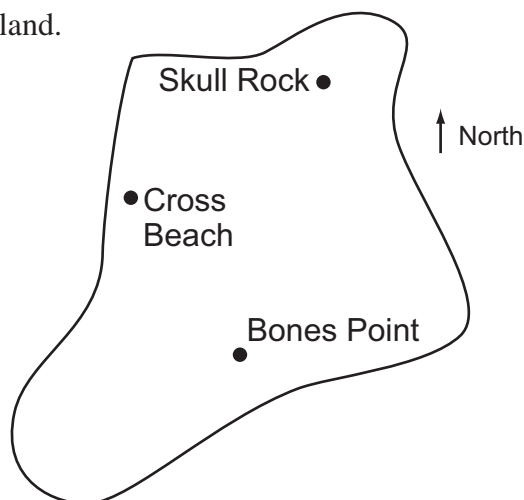


Not drawn
to scale

Which one of the following angle statements must be true?

- A** $\angle P + \angle Q + \angle R = 180^\circ$
- B** $\angle P + \angle R = 140^\circ$
- C** $\angle P + \angle R = 220^\circ$
- D** $\angle P = \angle R$

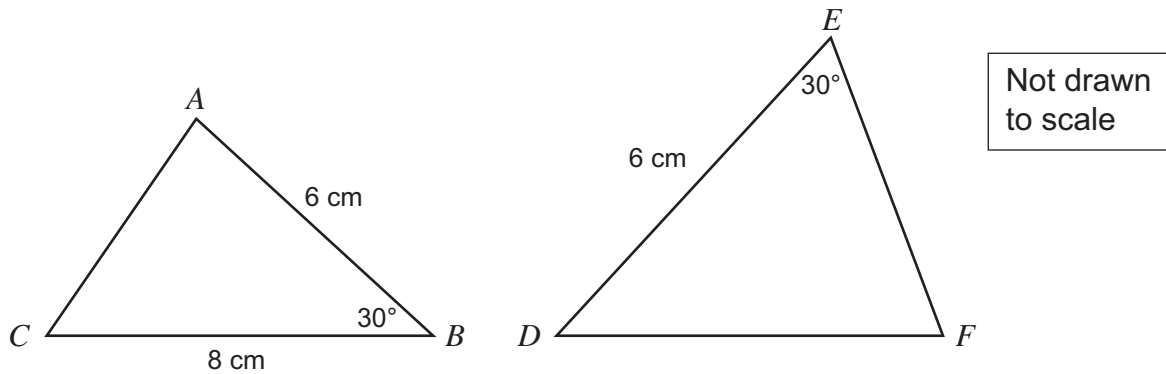
- 36** This is a map of Treasure Island.



Which one of the following statements is correct?

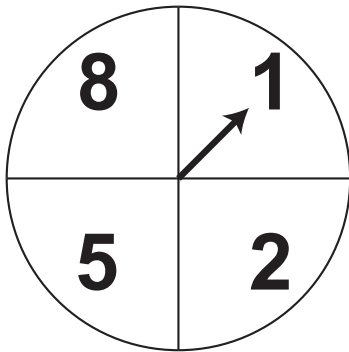
- A** The bearing of Bones Point from Skull Rock is due South.
- B** The bearing of Bones Point from Skull Rock is about 30° .
- C** The bearing of Cross Beach from Bones Point is about 30° .
- D** The bearing of Skull Rock from Bones Point is about 30° .

- 37** What additional information is necessary to prove that triangle ABC is congruent to triangle DEF ?



- A** angle $EDF = 70^\circ$
B $DF = 8$ cm
C $EF = 8$ cm
D $AC = 8$ cm

- 38** The arrow is spun twice. The resulting two numbers are added together.



What is the most likely sum?

- A** 7
B 9
C 10
D 13

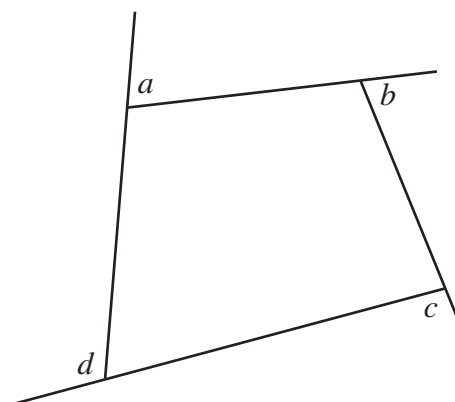
- 39** Factorise $6x^2 - 7x - 3$

- A** $(6x + 1)(x - 3)$
B $(x + 1)(6x - 3)$
C $(3x - 1)(2x + 3)$
D $(3x + 1)(2x - 3)$

- 40** Simplify $\frac{3^{(x+1)} + 12}{3^x + 4}$

- A** 3
B 6
C $\frac{13}{4}$
D $3^x + 3$

41



Which one of the following statements must be true?

- A $a + b + c + d = 360^\circ$
- B $a + b + c + d = 180^\circ$
- C $a + b = c + d$
- D $a + d = c + b$

42 2^{-4} has the same value as 4^{-2} . What is that value?

- A -8
- B -16
- C $\frac{1}{16}$
- D $\frac{1}{8}$

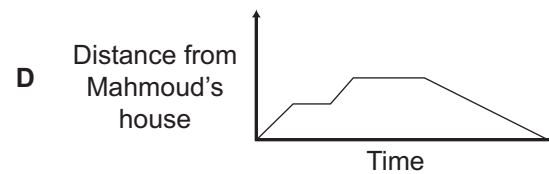
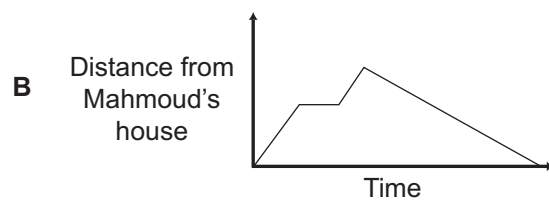
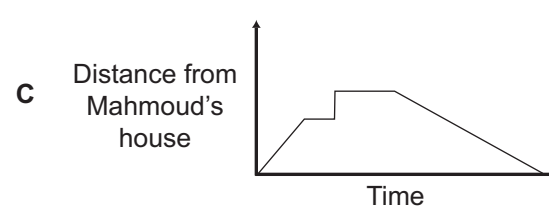
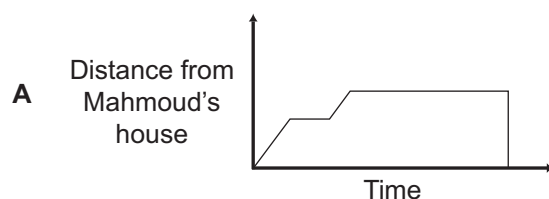
43 Which one of the following is the graph of $4(x + 3) - 8 \geq 0$?

- A
- B
- C
- D

- 44** The population of Abu Dhabi is given as 900 000 to the nearest hundred thousand, and 850 000 to the nearest ten thousand.
The population could be which one of the following?

A 849 300
B 854 800
C 859 700
D 867 300

- 45** Mahmoud cycled at a constant speed to Bilal's house, stopping to rest for a short while on the way. After a stay, he cycled home at a slower speed, but without stopping. Which one of the following is Mahmoud's travel graph?



- 46** Abid released 20 tagged fish into his fish farm. He later took a sample of 100 fish from the farm, and discovered that 6 were tagged. Based on this information, which one of the following is the best estimate of the number of fish in his farm?

A 120
B 126
C 300
D 600

- 47** The expression $\frac{48}{x+2}$ has a value between 3 and 8.

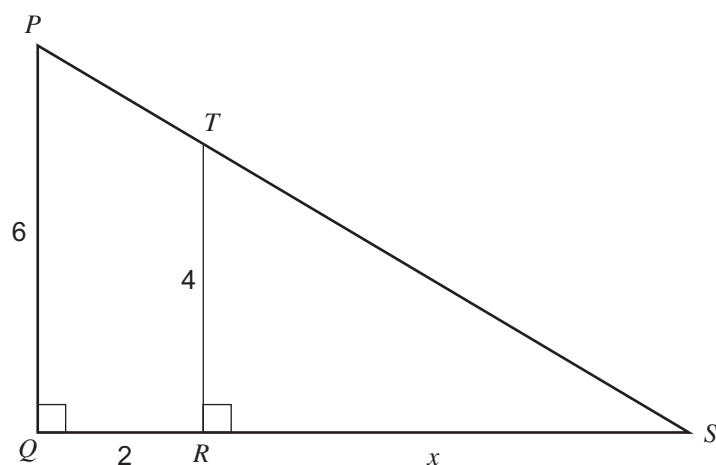
One of the following statements about x must be true. Which one?

A x must be equal to 9
B x must be larger than 14
C x must be smaller than 4
D x must be between 4 and 14

- 48** A rectangular prism has faces of area 3 cm^2 , 4 cm^2 and 12 cm^2 respectively. The volume of the prism is which one of the following?

A 19 cm^3
B 24 cm^3
C 72 cm^3
D 144 cm^3

49



Not drawn
to scale

Figures PQS and TRS are similar.

The size of angle S is which one of the following?

A 6°
B 24°
C 30°
D 45°

- 50** $x^2 - 13x + 36 = 0$ has solutions $x = 4$ and $x = 9$. What will be the solutions to $x^4 - 13x^2 + 36 = 0$?

A 2, 3
B 4, 9
C 16, 81
D $\pm 2, \pm 3$