Mock Grade 6

Maths Booklet 2

Paper 3H
Calculator

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1 Jane bought a new car three years ago.

At the end of the first year the value of the car had decreased by 10%
The value of the car then decreased by 15% each year for the next two years.

At the end of the three years, the value of the car was £23 409

Work out the value of the car when Jane bought it three years ago.

£..

(Total for Question 1 is 3 marks)

2 Rayheem has

24 shirts
8 pairs of jeans
3 jackets

Rayheem chooses an outfit to wear.
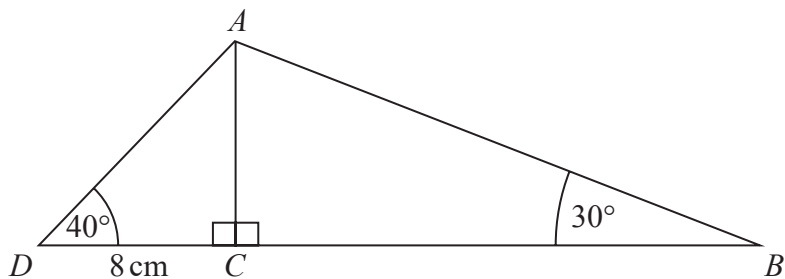An outfit is 1 shirt, 1 pair of jeans and 1 jacket.

Work out how many different outfits Rayheem can choose.

....

(Total for Question 2 is 2 marks)

3 *ABC* and *ACD* are right-angled triangles.

$DC = 8\,cm$
Angle $ADC = 40°$
Angle $ABC = 30°$

Work out the length of *BC*.
Give your answer correct to 3 significant figures.

.... cm

(Total for Question 3 is 3 marks)

4   **a** and **b** are vectors such that

$$\mathbf{a} = \begin{pmatrix} 3 \\ -2 \end{pmatrix} \qquad \text{and} \qquad 5\mathbf{a} - 2\mathbf{b} = \begin{pmatrix} 23 \\ -32 \end{pmatrix}$$

Find **b** as a column vector.

$$\begin{pmatrix} \dots\dots \\ \dots\dots \end{pmatrix}$$

(Total for Question 4 is 3 marks)

5 (a) Expand and simplify $(x - 5)(3x + 1)(x + 2)$

....
(3)

$$\frac{y^4 \times y^n}{y^8} = y^{-12}$$

(b) Find the value of n.

....
(2)

(c) Solve $4x^2 - 9x - 11 = 0$
Give your solutions correct to 3 significant figures.

....
(3)

(Total for Question 5 is 8 marks)

6 f(x) = 3tan$x$°

(a) Find f(30)
   Give your answer correct to 3 significant figures.

....

(1)

g(x) = 2x – 3

(b) Find fg(22)
   Give your answer correct to 3 significant figures.

....

(2)

h(x) = (x + 3)²

Ivan needs to solve the following equation h(x) = 25

He writes

   (x + 3)² = 25
   x^2 + 9 = 25
   x^2 = 16
   x = 4 or x = -4

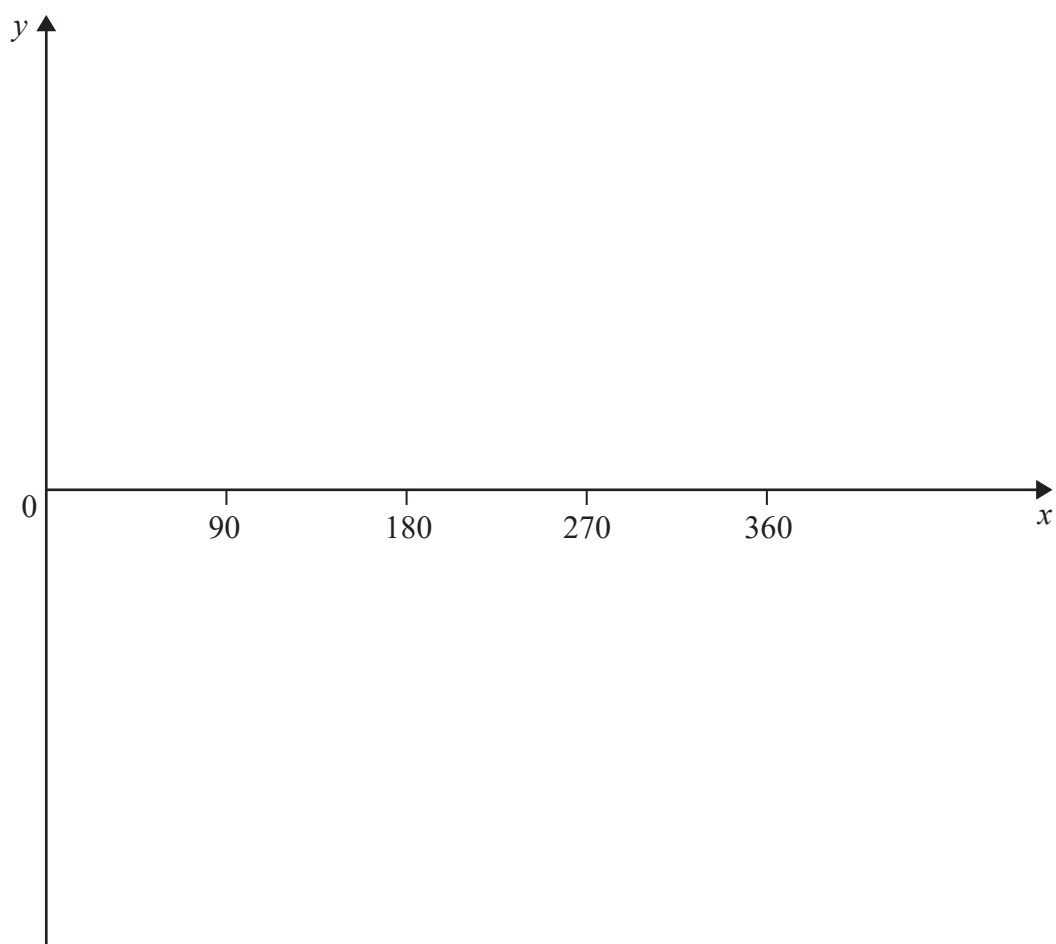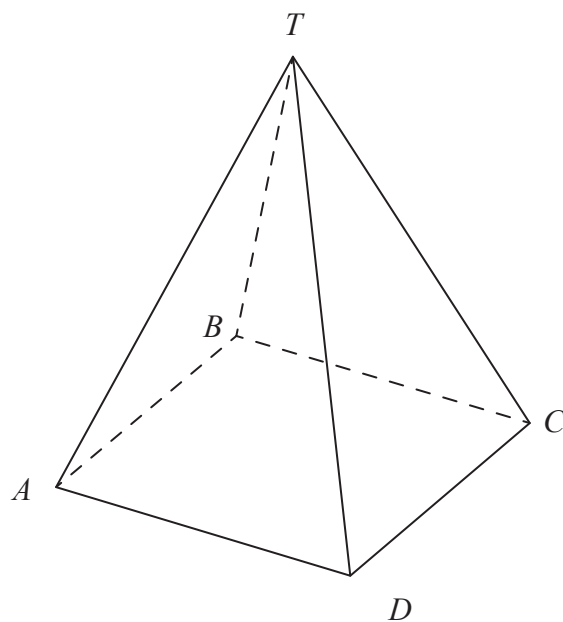This is not correct.

(c) Explain why.

....

....

(1)

(Total for Question 6 is 4 marks)

7 Sketch the graph of $y = \sin x°$ for $0 \leqslant x \leqslant 360$

(Total for Question 7 is 2 marks)

8 Here is a pyramid with a square base *ABCD*.

AB = 8 m

The vertex *T* is 20 m vertically above the midpoint of *AC*.

Calculate the size of angle *TAC*.

....°

(Total for Question 8 is 4 marks)