

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

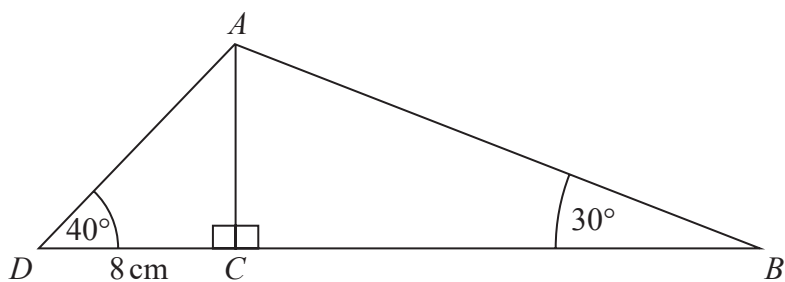
Rayheem chooses an outfit to wear.

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.



$$DC = 8 \text{ cm}$$

$$\text{Angle } ADC = 40^\circ$$

$$\text{Angle } ABC = 30^\circ$$

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

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

Find **b** as a column vector.

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

(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 $f(x) = 3\tan x^\circ$

(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)

$h(x) = (x + 4)^2$

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

He writes

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

$$x^2 + 9 = 25$$

$$x^2 = 16$$

$$x = 4 \text{ or } x = -4$$

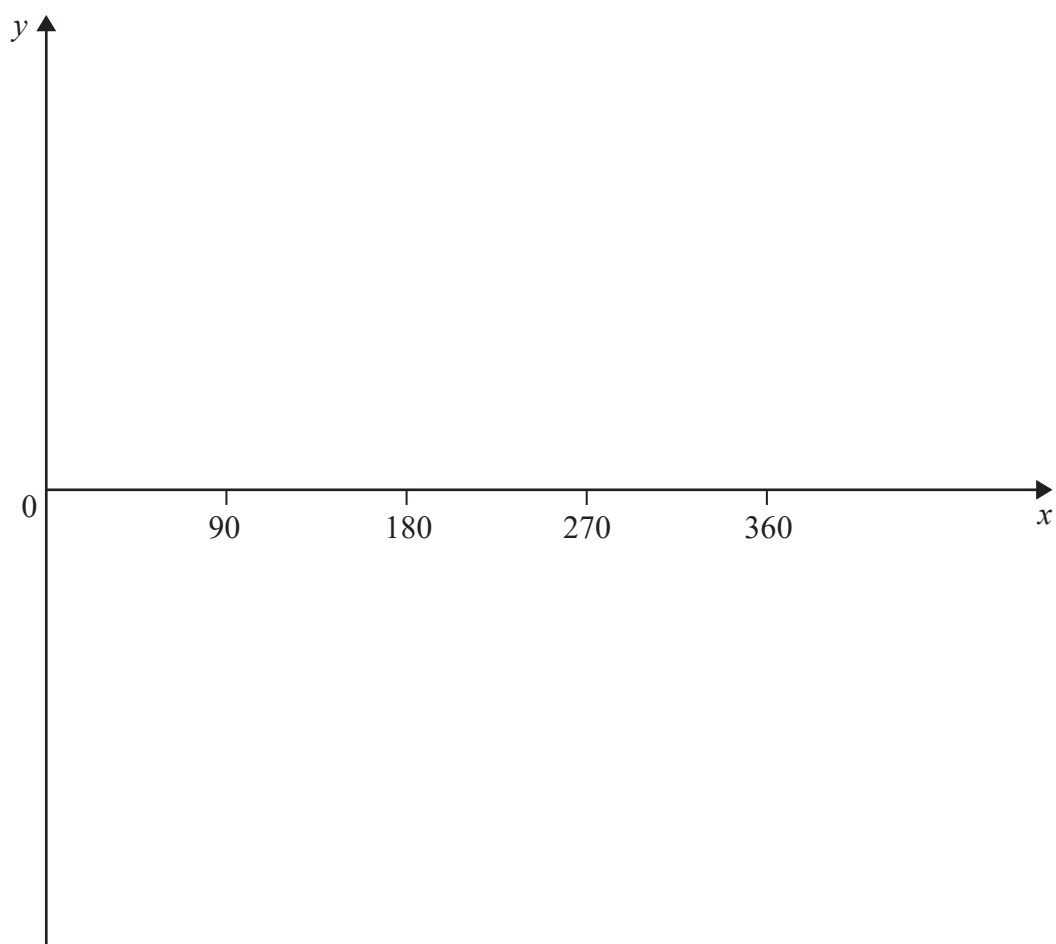
This is not correct.

(c) Explain why.

.....
.....
(1)

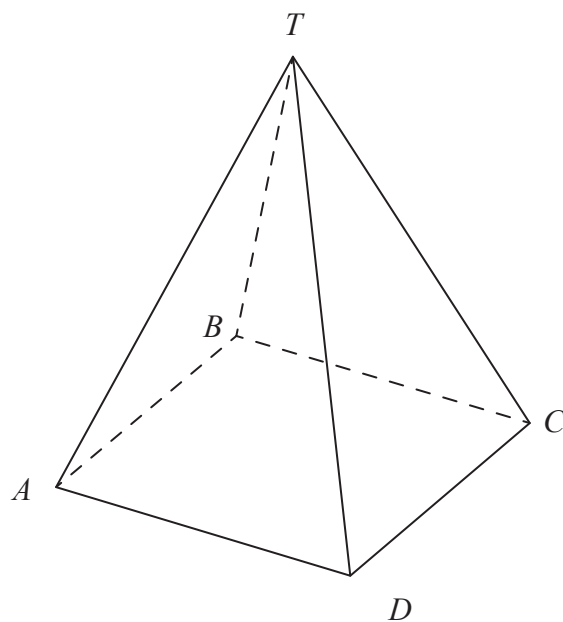
(Total for Question 6 is 4 marks)

7 Sketch the graph of $y = \sin x^\circ$ for $0 \leq x \leq 360$



(Total for Question 7 is 2 marks)

- 8 Here is a pyramid with a square base $ABCD$.



$$AB = 8 \text{ m}$$

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)