

09-June-2026



£x £y

A museum sells adult tickets or child tickets.

Fozia buys 4 adult tickets and 1 child ticket for £120

Sami buys 5 adult tickets and 3 child tickets for £171

Work out the cost of each type of ticket.

$$4x + y = 120 \rightarrow y = 120 - 4x$$

$$5x + 3y = 171$$

$$5x + 3(120 - 4x) = 171$$

$$5x + 360 - 12x = 171$$

$$~~-7x~~ + 360 = ~~171~~$$

$$-171$$

$$+7x$$

$$189 = 7x$$

$$x = \frac{189}{7}$$

$$x = £27$$

$$y = 120 - 4(27)$$

$$y = £12$$



Solve the simultaneous equations

$$4x + 3y = 7.5 \rightarrow \times 5 \rightarrow 20x + \cancel{15y} = 37.5$$

$$3x - 5y = 10.7 \rightarrow \times 3 \rightarrow 9x - \cancel{15y} = 32.1$$

(+)

$$29x = 69.6$$

$$x = \frac{69.6}{29} = 2.4$$

$$4(2.4) + 3y = 7.5$$

$$\cancel{9.6} + 3y = 7.5$$

$$-9.6$$

$$3y = -2.1$$

$$y = -0.7$$

$(2.4, -0.7) \rightarrow$ point of intersection



C is a graph with equation $x^2 + y^2 = 65 \rightarrow x^2 + y^2 = r^2 \rightarrow$ circle
centre (0,0)

L is a straight line with equation $2y = 10 - x$

Using algebra, find the coordinates of the point of intersection of C and L.
You must show all your working.

$$x = 10 - 2y$$

$$(10 - 2y)^2 + y^2 = 65$$

$$(10 - 2y)(10 - 2y) + y^2 = 65$$

$$100 - 40y + 4y^2 + y^2 = 65$$

$$5y^2 - 40y + 100 = \cancel{65}$$

-65

$$\frac{5y^2}{5} - \frac{40y}{5} + \frac{35}{5} = \frac{0}{5}$$

$$y^2 - 8y + 7 = 0$$

$$(y - 7)(y - 1) = 0$$

$$\underline{-7} \times \underline{-1} = \boxed{7} \quad \begin{matrix} a \times c \\ \hline \end{matrix}$$

$$y - 7 = 0$$

$$y - 1 = 0$$

$$\underline{-7} + \underline{-1} = \boxed{-8} \quad \begin{matrix} b \\ \hline \end{matrix}$$

$$y = 7$$

$$y = 1$$

$$x = 10 - 2(7)$$

$$x = 10 - 2(1)$$

$$x = -4$$

$$x = 8$$

$$(-4, 7) \text{ and } (8, 1)$$

* Simplify fully

$$\frac{8x^2 - 2}{6x^2 - 29x + 9} \times \left(\frac{1}{2x+1} + \frac{1}{x-2} \right)$$

$$8x^2 - 2 = 2(4x^2 - 1) = 2[(2x)^2 - 1^2]$$

$$a^2 - b^2 = (a+b)(a-b)$$

$$= 2(2x+1)(2x-1)$$

$$6x^2 - 29x + 9$$

$$a = 6, b = -29, c = 9$$

$$\underline{6x^2 - 27x} \quad \underline{-2x + 9}$$

$$\underline{-27} \times \underline{2} = \boxed{54} \quad \begin{matrix} a \times c \\ b \end{matrix}$$

$$\underline{-27} + \underline{-2} = \boxed{-29} \quad b$$

$$3x(2x-9) - 1(2x-9)$$

$$(2x-9)(3x-1)$$

$$\frac{x-2}{x-2} \times \left(\frac{1}{2x+1} + \frac{1}{x-2} \right) \times \frac{2x+1}{2x+1}$$

$$\frac{x-2 + 2x+1}{(x-2)(2x+1)} = \frac{3x-1}{(x-2)(2x+1)}$$

$$= \frac{2(2x+1)(2x-1)}{(2x-9)(3x-1)} \times \frac{(3x-1)}{(x-2)(2x+1)}$$

$$= \frac{2\cancel{(2x+1)}(2x-1)\cancel{(3x-1)}}{(2x-9)\cancel{(3x-1)}(x-2)\cancel{(2x+1)}}$$

$$= \frac{4x-4}{(2x-9)(x-2)}$$

* Solve $\frac{5x+2}{x+1} - \frac{x+8}{x+3} = 2$

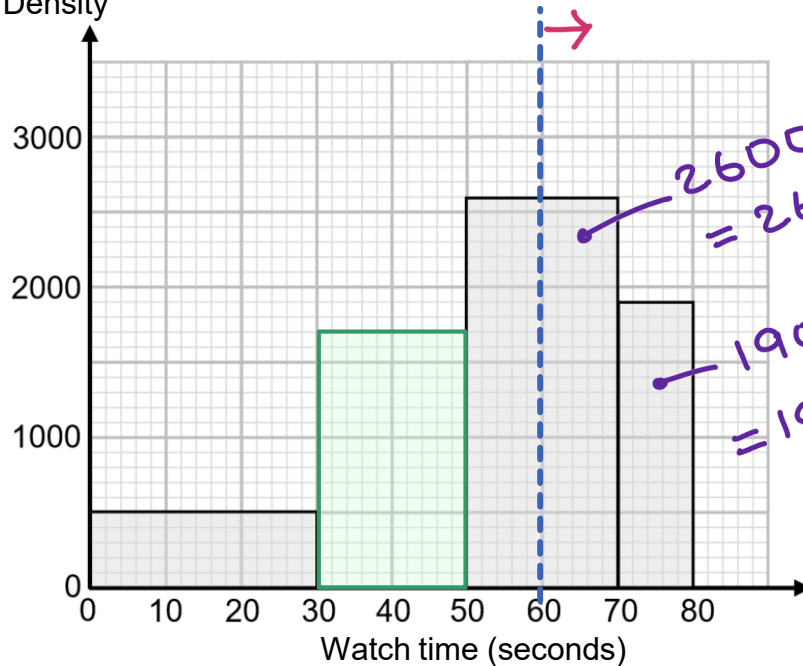
$$\frac{(5x+2)(x+3) - (x+8)(x+1)}{(x+1)(x+3)} = 2$$



20

The incomplete histogram shows information about the amount of time viewers spent watching an 80-second-long video on social media.

Frequency Density



20 (a)

(F) 34000 viewers watched for between 30 and 50 seconds. Complete the histogram.

[1 mark]

$$\text{F.D.} = \frac{F}{\text{C.W.}} = \frac{34000}{20} = 1700$$

20 (b)

The creator of the video receives 65p for every 1000 views that are for 60 seconds or more and no money for views less than 60 seconds.

Work out an estimate for the amount of money the creator made for this video.

[4 marks]

$$\# \text{ of people} = 45,000$$

$$£ 0.65 \times 45 = £ 29.25$$

Answer £ _____

9

Turn over ►





21

 a and b are constants where

$$f(x) = 5x - b \longrightarrow y = 5x - b$$

$$g(x) = bx + a$$

$$f^{-1}(18) = a$$

$$g(3) = 2$$

$$x = 5y - \cancel{b}$$

$$+b \quad +\cancel{b}$$

Find the values of a and b

[5 marks]

$$\frac{x+b}{5} = \frac{\cancel{5}y}{\cancel{5}}$$

$$f^{-1}(x) = \frac{x+b}{5}$$

$$f^{-1}(18) = \frac{18+b}{5}$$

$$\cancel{5} \times \frac{18+b}{\cancel{5}} = a \times 5 \quad 3b + a = 2$$

$$\cancel{18} + b = \cancel{5a}$$

$$-5a \quad -18$$

$$b - 5a = -18 \rightarrow \times 3 \rightarrow \cancel{3b} - 15a = -54$$

$$\begin{array}{r} \cancel{3b} + a = 2 \\ (-) \quad (-) \quad (-) \end{array}$$

$$3b + \cancel{3.5} = 2$$

$$-3.5$$

$$\cancel{3b} = \underline{-1.5}$$

$$\cancel{3} \quad 3$$

$$a =$$

$$b =$$

$$\begin{array}{r} \cancel{-16a} = \underline{-56} \\ -\cancel{16} \quad -16 \end{array}$$

$$a = 3.5$$

$$b = -0.5$$





22

 n is a four-digit number that is a multiple of 5.

$$2000 < n < 6000$$

Work out how many possible values of n there are.

[3 marks]

$$\underline{4} \times \underline{10} \times \underline{10} \times \underline{2}$$

$$= 800$$

Answer _____

23

Solve $\frac{x^2 + 11}{6} - \frac{x+1}{3} \leq 2$

[5 marks]

$$\cancel{6} \times \frac{x^2 + 11 - 2(x+1)}{\cancel{6}} \leq 2 \times 6$$

$$x^2 + 11 - 2x - 2 \leq \cancel{12}$$

$$-12$$

$$x^2 - 2x - 3 \leq 0$$

$$x^2 - 2x - 3 = 0$$

$$\underline{-3} \times \underline{1} = \boxed{-3}$$

$$a \times c$$

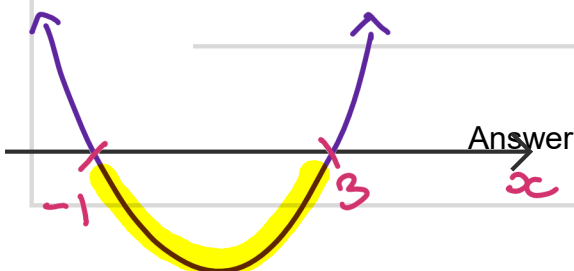
$$(x-3)(x+1) = 0$$

$$\underline{-3} + \underline{1} = \boxed{-2}$$

$$b$$

$$x = 3$$

$$x = -1$$



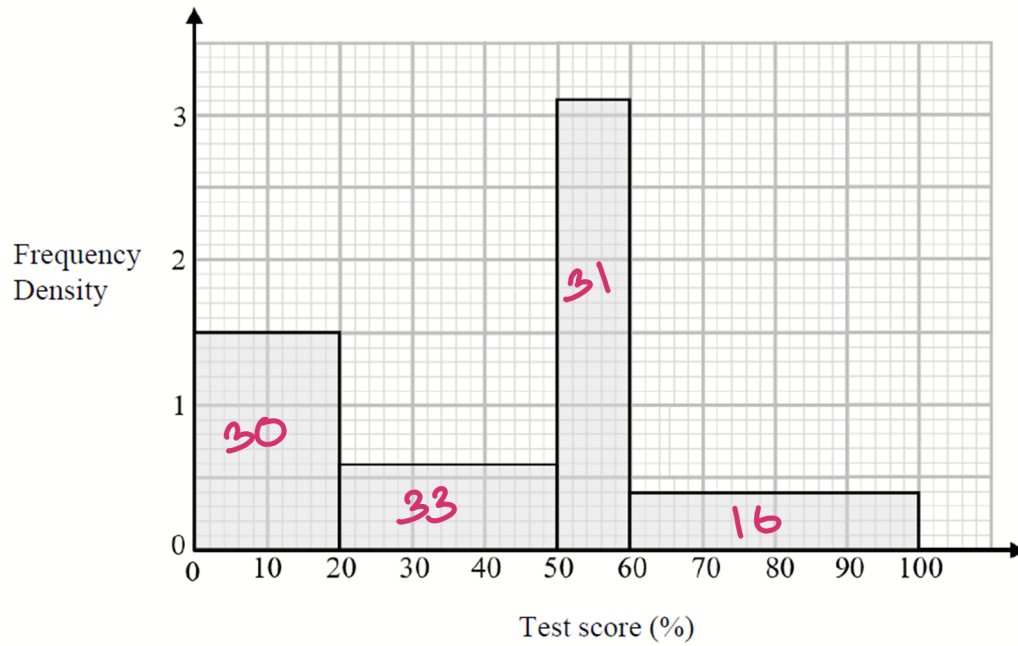
$$\boxed{-1 \leq x \leq 3}$$

Answer _____

13

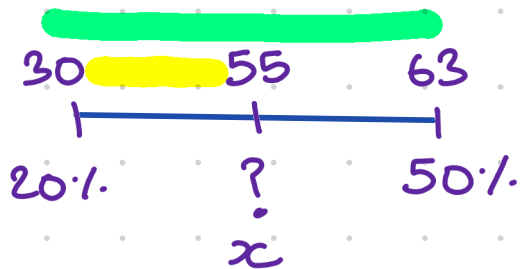
END OF QUESTIONS





total
= 110

$$\text{Median} = \frac{n}{2} = \frac{110}{2} = 55^{\text{th}} \text{ value}$$



$$\frac{25}{33} \times 30\% = 22.72\%$$

$$x = 42.72\%$$