

3rd January



Corbettmaths

Rearrange

$$y = \frac{5(x+w)}{w} \text{ to make } w \text{ the subject}$$

$$wy = 5x + 5w$$

$$wy - 5w = 5x$$

$$w(y-5) = 5x$$

$$w = \frac{5x}{y-5}$$

$$\text{Solve } \frac{16^{2x+5}}{4^x} = 32$$

$$\frac{(2^4)^{2x+5}}{(2^2)^x} = 2^5$$

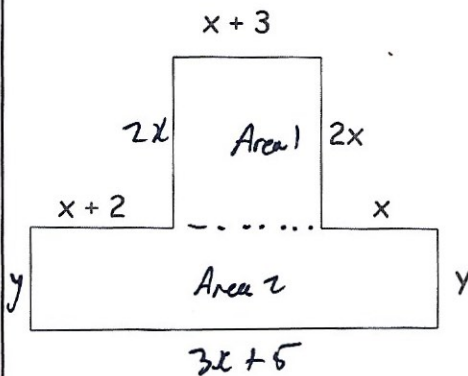
$$\frac{2^{8x+20}}{2^{2x}} = 2^5$$

$$2^{6x+20} = 2^5$$

$$6x+20=5$$

$$x = -2.5$$

The shape below is made from two rectangles.



The perimeter of the shape is 120cm.

The area of the shape is $A \text{ cm}^2$

$$\begin{aligned} \text{Area 1: } & 2x(x+3) \\ & = 2x^2 + 6x \end{aligned}$$

$$\begin{aligned} \text{Area 2: } & y(3x+5) \\ & = (55-5x)(3x+5) \\ & = 165x + 275 - 15x^2 - 25x \\ & = -15x^2 + 140x + 275 \end{aligned}$$

Show that $y = 55 - 5x$

$$10x + 2y + 10 = 120$$

$$2y = 110 - 10x$$

$$y = 55 - 5x$$

Show that $A = 275 + 146x - 13x^2$

$$A = 2x^2 + 6x + 275 + 140x - 15x^2$$

$$A = 275 + 146x - 13x^2$$

Use differentiation to find the value of x for which A is a maximum $\rightarrow \frac{dA}{dx} = 0$

$$\frac{dA}{dx} = 146 - 26x$$

$$146 - 26x = 0$$

$$26x = 146$$

$$x = \frac{146}{26}$$

$$x = \frac{73}{13}$$