

22nd January



A cuboid has length $(x + 9)$ cm, width $(x + 2)$ cm and height 5cm. The surface area of the cuboid is 400cm^2 .

Find the value of x to 2 decimal places.

Corbettmaths

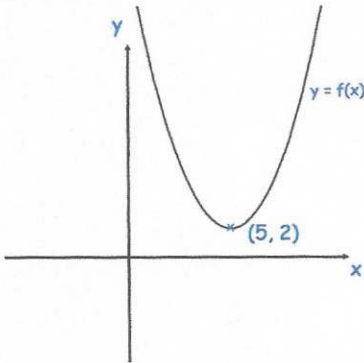
$$\left. \begin{aligned} (x+9)(x+2) &= x^2 + 11x + 18 \\ S(x+2) &= 5x + 10 \\ S(x+9) &= 5x + 45 \end{aligned} \right\} \times 2$$

$$\text{surface area} = 2x^2 + 42x + 146 = 400$$

$$2x^2 + 42x - 254 = 0$$

$$x^2 + 21x - 127 = 0$$

$$x = 4.90 \checkmark \text{ or } x = -25.90 \times$$



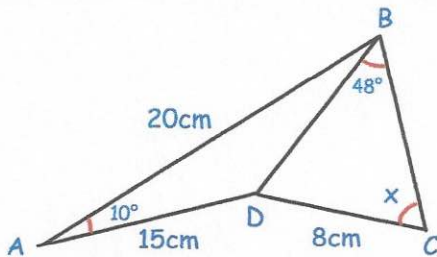
Shown is the curve with equation $y = f(x)$. The coordinates of the minimum point of the curve are $(5, 2)$.

Which transformation will have a minimum point of $(-5, 2)$?

$$f(-x)$$

Which transformation will have a minimum point of $(8, 2)$?

$$f(x-3)$$



Find x

$$BD^2 = 20^2 + 15^2 - 2 \times 20 \times 15 \times \cos 10$$

$$BD^2 = 34.11 \dots$$

$$BD = 5.84 \dots$$

$$\frac{\sin x}{5.84 \dots} = \frac{\sin 48}{8}$$

$$\sin x = 0.5425 \dots$$

$$x = 32.859^\circ$$

$$w = \frac{\sqrt{c}}{p} \quad \text{max } w = \frac{\sqrt{4.245}}{7.8795}$$

$$= 0.2614810302$$

$c = 4.24$ correct to 2 decimal places
 $p = 7.88$ correct to 3 decimal places

$$\text{min } w = \frac{\sqrt{4.235}}{7.8805} = 0.2611397199$$

By considering bounds, work out the value of w to a suitable degree of accuracy.

$$w = 0.261 \text{ to } 3 \text{ dp}$$