



Corbettmaths

29th April

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

Work out the value of

$$f^{-1}(-27)$$

$$f^{-1}(x) = \sqrt[3]{y} - 5$$

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

$$\sqrt[3]{y} = x + 5$$

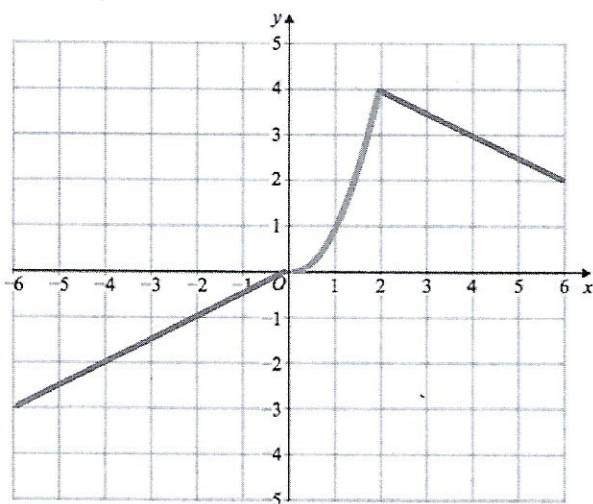
$$x = \sqrt[3]{y} - 5$$

$$f^{-1}(-27) = \sqrt[3]{-27} - 5$$

$$= -3 - 5$$

$$= -8$$

Here is a graph of $y = f(x)$
It consists of a quadratic curve and two straight lines.

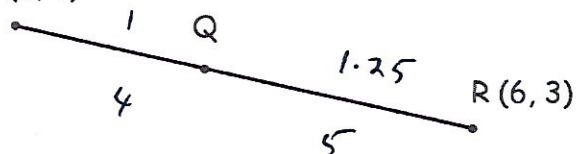
Define $f(x)$

$$f(x) = \frac{1}{2}x \quad -6 \leq x < 0$$

$$= x^2 \quad 0 \leq x < 2$$

$$= -\frac{1}{2}x + 5 \quad 2 \leq x \leq 6$$

P(2, 4)



$$PQ : QR = 4 : 5$$

QR is 25% longer than PQ

Work out the coordinates of Q.

$$\vec{PR} = \begin{pmatrix} 4 \\ -1 \end{pmatrix} \quad \frac{1}{9}\vec{PR} = \begin{pmatrix} \frac{4}{9} \\ -\frac{1}{9} \end{pmatrix}$$

$$\frac{4}{9}\vec{PR} = \vec{PQ} = \begin{pmatrix} \frac{16}{9} \\ -\frac{4}{9} \end{pmatrix}$$

$$Q \left(\frac{34}{9}, \frac{32}{9} \right)$$

Find the centre and radius of the circle
with equation

$$x^2 + y^2 = 18x$$

$$x^2 - 18x + y^2 = 0$$

$$(x - 9)^2 - 81 + y^2 = 0$$

$$(x - 9)^2 + y^2 = 81$$

$$r = 9$$

$$c = (9, 0)$$