8th September

Corbettmaths

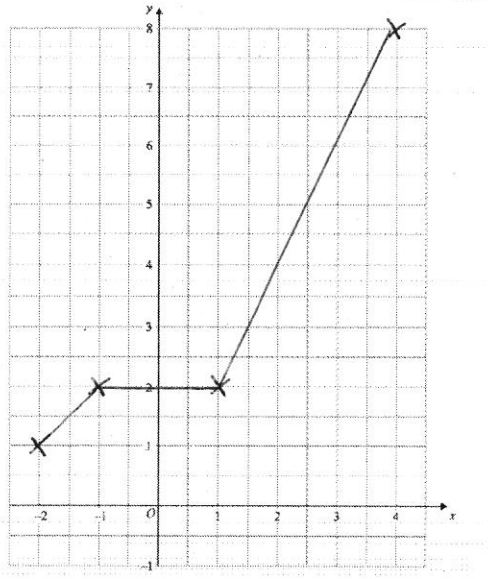
A function f(x) is defined as

$$f(x) = x + 3 \qquad -2 \le x < -1$$

$$= 2 \qquad -1 \le x < 1$$

$$= 2x \qquad 1 \le x \le 4$$

Draw the graph of $y = f(x)$



Solve

$x^{\frac{2}{3}} + x^{-\frac{1}{3}} = 2x^{\frac{5}{3}}$

$(\times x^{\frac{1}{3}}) \quad x + 1 = 2x^2$

$0 = 2x^2 - x - 1$

$0 = (x-1)(2x+1)$

$x = 1, \; x = -\frac{1}{2}$

Show that the tangents to the curve $y = x^3 - 4x^2 - 4x + 4$ at $x = -\frac{1}{3}$ and $x = 3$ are parallel.

$\frac{dy}{dx} = 3x^2 - 8x - 4$

$x = -\frac{1}{3} \Rightarrow \frac{dy}{dx} = \frac{1}{3} + \frac{8}{3} - 4 = -1$

$x = 3 \Rightarrow \frac{dy}{dx} = 27 - 24 - 4 = -1$

$\Rightarrow$ parallel.