

• • • Determine whether $x-1$
is a factor of $x^3 - x^2 - 3x - 3$
 $x-1=0$
 $x=1$

$$(1)^3 - (1)^2 - 3(1) - 3 = \textcircled{-6}$$

$x-1$ is Not a factor
 1 is NOT a root

$(1, -6)$ is a point on the graph

$$f(x) = x^2 + 10x + 21 \quad \overset{?}{x+3} \text{ a factor?}$$

$$f(-3) = (-3)^2 + 10(-3) + 21$$

$$f(-3) = 0$$

$x+3$ is a factor

-3 is a root $(-3, 0)$

Solving

and the

Rational Root Theorem



Solve by factoring - then check your answer using the graphing calculator

$$y = 2x^2 + 1x - 1$$

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

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

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

$$2x - 1 = 0 \quad x + 1 = 0$$

$$\frac{2}{2}x = \frac{1}{2}$$

$$x = \frac{1}{2} \quad x = -1$$

$$\begin{array}{r} -2 \\ +2 \quad -1 \\ \hline 1 \end{array}$$

Solve by factoring - then check your answer using the graphing calculator

$$2x^3 - 7x^2 + 3x = 0$$

$$\times (2x^2 - 7x + 3) = 0 \quad \text{O G C F}$$

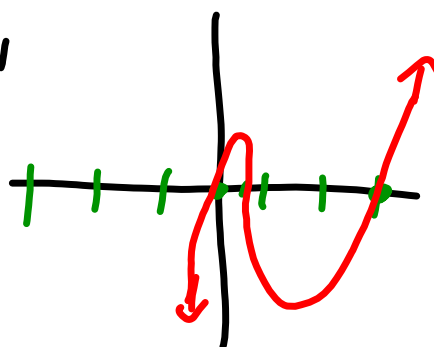
$$\times ((2x^2 - \cancel{1x} - 6x + 3)) \quad \begin{array}{c} 6 \\ -1 \times -6 \\ -7 \end{array}$$

$$\times [x(2x-1) - 3(2x-1)]$$

$$= \times (x-3)(2x-1) = 0$$

$$x=0 \quad x-3=0 \quad 2x-1=0$$

$$\boxed{x=0 \quad x=3 \quad x=\frac{1}{2}}$$



Solve by factoring -

$$y = x^3 + 125$$

$$(x + 5)(x^2 - 5x + 25) = 0$$

$$x + 5 = 0$$

$$x = -5$$

$$x^2 - 5x + 25 = 0$$

$$\frac{5 \pm \sqrt{(-5)^2 - 4(1)(25)}}{2(1)}$$

$$\frac{5 \pm \sqrt{-75}}{2}$$

$$x = -5, \frac{5 \pm 5i\sqrt{3}}{2}$$

$$\frac{\sqrt{75}}{5\sqrt{3}}$$

Use quadratic formula to solve

Solve by factoring

$$y = (27x^3 - 8)$$

$$(3x-2)(9x^2 + \underline{6}x + 4)$$

$$3x - 2 = 0$$

$$3x = 2$$

$$x = \frac{2}{3}$$

$$\frac{-6 \pm \sqrt{36 - 4(9)(4)}}{2(9)}$$

$$\frac{-6 \pm \sqrt{-108}}{18}$$

$$\frac{-6 \pm 6i\sqrt{3}}{18}$$

$$\frac{\sqrt{-108}}{i\sqrt{36 \cdot 3}}$$

$$6i\sqrt{3}$$

$$x = \frac{2}{3}, \frac{-1 \pm i\sqrt{3}}{3}$$