

Solving polynomials

Recall: Quadratic Formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

List all possible rational roots. Then find all real roots.

1) $2x^3 + 13x^2 + 17x - 12 = 0$

2) $4x^3 + 16x^2 - 22x - 10 = 0$

$$\begin{array}{r|rrrr} -5 & 4 & 16 & -22 & -10 \\ & \downarrow & -20 & 20 & 10 \\ \hline & 4 & -4 & -2 & \boxed{0} \end{array}$$

$$4x^2 - 4x - 2 = 0$$

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

~~-2~~
~~-2~~

$a = 2$

$b = -2$

$c = -1$

$$x = \frac{2 \pm \sqrt{(-2)^2 - 4(2)(-1)}}{2(2)}$$

$$x = \frac{2 \pm \sqrt{12}}{4}$$

$$x = \frac{2 + \sqrt{12}}{4} = 1.37$$

3) $3x^3 - 18x^2 - 9x + 132 = 0$

4) $x^4 - 2x^3 - 2x^2 = 0$

$$x = \frac{2 - \sqrt{12}}{4} = -0.37$$

$$\boxed{x = 1.37, -0.37, -5}$$