

**Polynomial:**

$$P(x) = x^5 - 11x^3 + 12x^2 - 26x + 24$$

**Possible Rational Zeros:**

$$\frac{\pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 8, \pm 12, \pm 24}{\pm 1} = \pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 8, \pm 12, \pm 24$$

$$P(1) = 0$$

$$P(3) = 0$$

$$\begin{array}{r|rrrrrr} 1 & 1 & 0 & -11 & 12 & -26 & 24 \\ & & 1 & 1 & -10 & 2 & -24 \\ \hline 3 & 1 & 1 & -10 & 2 & -24 & 0 \\ & & 3 & 12 & 6 & 24 & \\ \hline & 1 & 4 & 2 & 8 & 0 & \end{array}$$

$$\begin{aligned} & \rightarrow (x-1)(x-3)(x^3 + 4x^2 + 2x + 8) \\ & (x-1)(x-3)(x^2(x+4) + 2(x+4)) \\ & (x-1)(x-3)(x^2 + 2)(x+4) = 0 \end{aligned}$$

**Complete Factorization:**

$$(x-1)(x-3)(x^2+2)(x+4)$$

$$x = -1 \quad \left| \quad x = 3 \quad \left| \quad \begin{array}{l} x^2 + 2 = 0 \\ x^2 = -2 \\ x = \pm i\sqrt{2} \end{array} \right. \quad \left| \quad x = -4 \right.$$

**Complete Solution Set:**

$$\{-4, 1, 3, \pm i\sqrt{2}\}$$

~~Check:~~