

How do you find the roots of the equations $x^3 - 12x^2 - 2x + 24 = 0$ and $x^3 - 5x^2 + 4x = 0$.

Solution:

$$x^3 - 12x^2 - 2x + 24 = 0$$

$$x^2(x - 12) - 2(x - 12) = 0$$

$$(x - 12)(x^2 - 2) = 0$$

$$(x - 12)(x - \sqrt{2})(x + \sqrt{2}) = 0$$

So $x_1 = -\sqrt{2}, x_2 = \sqrt{2}, x_3 = 12$.

$$x^3 - 5x^2 + 4x = 0$$

$$x(x^2 - 5x + 4) = 0$$

$$x(x - 4)(x - 1) = 0$$

So $x_1 = 0, x_2 = 1, x_3 = 4$.

Answer: roots of equation $x^3 - 12x^2 - 2x + 24 = 0$ are $x_1 = -\sqrt{2}, x_2 = \sqrt{2}, x_3 = 12$, roots of equation $x^3 - 5x^2 + 4x = 0$ are $x_1 = 0, x_2 = 1, x_3 = 4$.