

Find ALL solutions by factoring.

1. $2x^4 - 4x^3 + 10x^2 - 20x = 0$

2. $3x^6 - 3x^4 = 60x^2$

3. $12x^6 - 588x^2 = 0$

Answers

Find ALL solutions by factoring.

1. $2x^4 - 4x^3 + 10x^2 - 20x = 0$

$$2x(x^3 - 2x^2 + 5x - 10) = 0$$

$$2x(x-2)(x^2+5) = 0 \quad \begin{matrix} x^2+5=0 \\ \sqrt{x^2} = \sqrt{-5} \end{matrix}$$

	x	-2
x^2	x^3	$-2x^2$
$+5$	$+5x$	-10

$$x = 0, 2, \pm i\sqrt{5}$$

2. $3x^6 - 3x^4 = 60x^2$

$$3x^6 - 3x^4 - 60x^2 = 0$$

$$3x^2(x^4 - x^2 - 20) = 0$$

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

$$x = 0, \pm\sqrt{5}, \pm 2i$$

↑
double zero

$$\begin{array}{r} -20 \\ -5 \times +4 \\ - \end{array}$$

3. $12x^6 - 588x^2 = 0$

$$12x^2(x^4 - 49) = 0$$

$$12x^2(x^2+7)(x^2-7) = 0$$

$$x = 0, \pm i\sqrt{7}, \pm\sqrt{7}$$

↑
double zero