Mat120 - 13.4 - Prehomework Name:_____

Solve for x:

1. $x^4 - 6x^2 + 8 = 0$

u = _____

u^2 = _____

Answer:_____

3. $x^{-2} + x^{-1} - 56 = 0$

u = _____

u^2 = _____

Answer:_____

3. $x^{\frac{2}{3}} - x^{\frac{1}{3}} - 12 = 0$

u = _____

u^2 = _____

Answer:_____

4. $(x^2 + 2x)^2 - 14(x^2 + 2x) = 15$

u = _____

u^2 = _____

Answer:_____

Mat120 -13.4 · Prehomework Name: Key

Solve for x:

1. $x^4 - 6x^2 + 8 = 0$

u = x^2

u^2 = $(x^2)^2 = x^4$

$u^2 - 6u + 8 = 0$

$(u-4)(u-2) = 0$

$u = 4$ $u = 2$

$x^2 = 4$ $x^2 = 2$

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

$x = \pm 2$

Answer: $x = \pm 2$, $x = \pm\sqrt{2}$

3. $x^{-2} + x^{-1} - 56 = 0$

u = x^{-1}

u^2 = x^{-2}

$u^2 + u - 56 = 0$

$(u+8)(u-7) = 0$

$u = -8$ $u = 7$

$x^{-1} = -8$ $x^{-1} = 7$

$(x^{-1})^{-1} = (-8)^{-1}$ $(x^{-1})^{-1} = 7^{-1}$

$x = \frac{1}{-8}$ $x = \frac{1}{7}$

Answer: $x = -\frac{1}{8}$; $x = \frac{1}{7}$

3. $x^{\frac{2}{3}} - x^{\frac{1}{3}} - 12 = 0$

u = $x^{\frac{1}{3}}$

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

$u^2 - u - 12 = 0$

$(u-4)(u+3) = 0$

$u = 4 \quad u = -3$

$x^{\frac{1}{3}} = 4 \quad x^{\frac{1}{3}} = -3$

$(x^{\frac{1}{3}})^3 = 4^3 \quad (x^{\frac{1}{3}})^3 = (-3)^3$

$x = 64 \quad x = -27$

Answer: $x = 64 \quad x = -27$

4. $(x^2 + 2x)^2 - 14(x^2 + 2x) = 15$

u = (x^2+2x)

u^2 = $(x^2+2x)^2$

$u^2 - 14u = 15$

$u^2 - 14u - 15 = 0$

$(u-15)(u+1) = 0$

$u = 15 \quad u = -1$

$x^2 + 2x = 15$

$x^2 + 2x - 15 = 0$

$(x+5)(x-3) = 0$

$x = -5 \quad x = 3$

$x^2 + 2x = -1$

$x^2 + 2x + 1 = 0$

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

$x = -1$

Answer: $x = -5 \quad x = 3$

$x = -1$