Trial And Error

$3x^2 + x - 4$

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

$3x^2 - 12x + x - 4$

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

$3x^2 + 3x - 4x - 4$

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

$3x^2 + 12x - x - 4$

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

$3x^2 - 3x + 4x - 4$

$3x^2 + x - 4$

1, -4	-4, 1	
-1, 4	4, -1	
1		
2, -2	-2, 2	

YES!

Trial By Error

8037

(15) $x^8 + 12x^4 + 35 = 0$ 5.7

$(x^4+5)(x^4+7) = 0$

$(x^4+5) = 0$ $\quad$ $(x^4+7) = 0$

$-5 = -5$ $\quad$ $-7 = -7$

$\sqrt[4]{x^4} = \sqrt[4]{-5}$ $\quad$ $\sqrt[4]{x^4} = \sqrt[4]{-7}$

$x = \sqrt[4]{-5}$ $\quad$ $x = \sqrt[4]{-7}$

$(x^4+5)(x^4+7)$

$x^8 + 7x^4 + 5x^4 + 35$

$x^8 + 12x^4 + 35$

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

$(x^2+4)(x^2-1) = 0$

$1 \cdot 4 \quad -4 \cdot 1$

$-1 \cdot 4 \quad 4 \cdot -1$

$x^2 - 1$

$(x-1)(x+1)$

Factor Difference of Two Squares

$(A)^2 - (B)^2 = (A-B)(A+B)$

$(x-1)(x+1)(x^2+4) = 0$

$x - 1 = 0$ $\quad$ $x + 1 = 0$ $\quad$ $x^2 + 4 = 0$

$+1 \quad +1$ $\quad$ $-1 \quad -1$ $\quad$ $-4 \quad -4$

$x = 1$ $\quad$ $x = -1$ $\quad$ $\sqrt{x^2} = \sqrt{-4}$

$x = \sqrt{-4}$ non-real solution

(17) $x^4 - 81 = 0$

$(x^2+9)(x^2-9) = 0$ $\quad A^2 - B^2 = (A-B)(A+B)$

$(x^2+9)(x+3)(x-3) = 0$

$x^2 + 9 = 0$ $\quad$ $x + 3 = 0$ $\quad$ $x - 3 = 0$

$-9 \quad -9$ $\quad$ $-3 \quad -3$ $\quad$ $+3 \quad +3$

$\sqrt{x^2} = \sqrt{-9}$ $\quad$ $x = -3$ $\quad$ $x = 3$

$x = \sqrt{-9}$

non-real