

# Solving Polynomials

## Quest Review.

$$\textcircled{1} \quad x = -2$$
$$x = 1$$
$$x = 5$$

$$\textcircled{2} \quad x = 0$$
$$x = 1$$

$$\textcircled{3} \quad x = -3.5$$
$$x = 0$$
$$x = 1$$

$$\textcircled{4} \quad x = -\frac{1}{2}$$
$$x = 0$$
$$x = 3$$

$$\textcircled{5} \quad x = -\frac{1}{2}$$
$$x = 0$$
$$x = \frac{3}{2}$$

$$\textcircled{6} \quad (a+b)(a^2 - ab + b^2)$$

$$\textcircled{7} \quad (a-b)(a^2 + ab + b^2)$$

$$\textcircled{8} \quad x(x-3)(x-3)$$

$$x = 0$$

$$x = 3$$

$$x = 3$$

$$\textcircled{9} \quad (x+3)(x^2 - 3x + 9)$$

$$x = -3$$

$$x = \frac{3 \pm 3i\sqrt{3}}{2}$$

$$\textcircled{10} (x-1)(x+1)(x^2-7)$$

$$x=1$$

$$x=-1$$

$$x=\pm\sqrt{7}$$

$$\textcircled{11} 2x(x-5)(x-4)$$

$$x=0$$

$$x=5$$

$$x=4$$

$$\textcircled{12} (x-5)(x^2+5x+25)$$

$$x=5$$

$$x=\frac{-5\pm 5i\sqrt{3}}{2}$$

$$\textcircled{13} (x+2)(x-2)(x+1)(x-1)$$

$$x=2$$

$$x=-2$$

$$x=1$$

$$x=-1$$

$$\textcircled{14} x(x+1)(3x-5)$$

$$x=0$$

$$x=-1$$

$$x=5/3$$

$$\textcircled{15} (3x+1)(9x^2-3x+1)$$

$$x=-1/3$$

$$x=\frac{1\pm i\sqrt{3}}{6}$$

$$\textcircled{16} (2x-3)(4x^2+6x+9)$$

$$x=3/2$$

$$x=\frac{-3\pm 3i\sqrt{3}}{4}$$

$$\textcircled{17} (x^2-2)(x^2+6)$$

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

$$x=\pm i\sqrt{6}$$

$$(18) 8(2x-3)(4x^2+6x+9)$$

$$x = 3/2$$

$$x = \frac{-3 \pm 3i\sqrt{3}}{4}$$

$$(19) (x^2-2)(x^2+2)$$

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

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

$$(20) (a-b)^2 = a^2 - 2ab + b^2$$

$$a) (a-b)^2 \quad (\text{given})$$

$$(a-b)(a-b) \quad (\text{prod of exponents})$$

$$a^2 - ab - ab + b^2 \quad (\text{FOIL})$$

$$a^2 - 2ab + b^2 \quad (\text{combine like terms})$$

QED

$$b) \text{ let } a=1 \text{ and } b=2$$

$$(1-2)^2 = (1)^2 - 2(1)(2) + (2)^2$$

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

$$1 = 1 \quad \checkmark \text{ verified}$$

$$(21) (x+y)^2(x-y) = x^3 + x^2y - xy^2 - y^3$$

$$a) (x+y)^2(x-y) \quad (\text{given})$$

$$(x+y)(x+y)(x-y) \quad (\text{prod of exponents})$$

$$(x^2 + xy + xy + y^2)(x-y) \quad (\text{FOIL})$$

$$(x^2 + 2xy + y^2)(x-y) \quad (\text{combine like terms})$$

$$x^3 - x^2y + 2x^2y - 2xy^2 + xy^2 - y^3 \quad (\text{mult poly})$$

$$x^3 + x^2y - xy^2 + y^3 \quad (\text{combine like terms})$$

QED

$$b) \text{ let } a=1 \text{ and } b=2$$

$$(1+2)^2(1-2) = (1)^3 + (1)^2(2) - (1)(2)^2 - (2)^3$$

$$(3)^2(-1) = 1 + 1(2) - 1(4) - 8$$

$$9(-1) = 1 + 2 - 4 - 8$$

$$-9 = 3 - 4 - 8$$

$$-9 = -1 - 8$$

$$-9 = -9 \quad \checkmark \text{ verified}$$