Algebra 1 Workbook

Factoring

GREATEST COMMON FACTOR

■ 1. Factor out the greatest common factor.

$$3x^2y^3 + 12x^3y^2 - 9x^4y^4$$

■ 2. Factor the polynomial in the numerator and simplify the resulting expression. Fill in the blank with the correct term.

$$\frac{3x^3 - 12x}{3x} = x^2 - \underline{\quad\quad}$$

■ 3. Factor the expression.

$$9s^3t^2 + 15s^2t^5 - 24s^5t + 6s^4t^2$$

■ 4. What went wrong when the polynomial was factored?

$$10x^3y^4 - 5x^4y^2 - 20x^6y^3$$

$$x^3y^2(10y^2 - 5x - 20x^3y)$$

■ 5. Factor the polynomial in the numerator and simplify the resulting expression.

$$\frac{4x^4 - 8x^3 - 32x^2}{4x^2}$$

6. Fill in the blank with the correct term.

$$4a^3b - 10ab^2 + \underline{\hphantom{XXX}} = 2ab(2a^2 - 5b + 3a^2b^2)$$

QUADRATIC POLYNOMIALS

■ 1. Factor the quadratic expression.

$$2x^2 + 2x - 12$$

■ 2. What went wrong when the polynomial was factored?

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

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

■ 3. Factor the quadratic expression.

$$x^2 + 3x - 28$$

■ 4. Factor the quadratic expression.

$$x^2 - 9x + 18$$

■ 5. Fill in the blank with the correct term.

$$5x^2 - 40x + 60 = \underline{}(x - 2)(x - \underline{})$$

■ 6. Factor the quadratic expression.

$$x^2 - x - 2$$

DIFFERENCE OF SQUARES

■ 1. Factor the expression.

$$4y^2 - 36$$

■ 2. What went wrong when the polynomial was factored?

$$9a^4 - 25b^2$$

$$(9a^2 - 25b)(9a^2 + 25b)$$

■ 3. Factor the expression.

$$49x^6y^2 - 36z^4$$

■ 4. Fill in the blank with the correct term.

$$\underline{\quad\quad} - 25y^2 = (2xz^2 - 5y)(2xz^2 + 5y)$$

■ 5. Factor the expression.

$$2x^2 - 288$$

■ 6. Factor the expression.

$$5a^3 - 20ab^2$$

ZERO THEOREM

■ 1. Find the zeros of the function.

$$y = x^2 - 5x + 6$$

■ 2. Find the zeros of the function.

$$y = x^2 - 4x - 5$$

■ 3. Find the x-intercepts.

$$f(x) = x^2 + 10x + 24$$
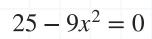
■ 4. Find the x-intercepts.

$$f(x) = x^2 - 7x + 6$$

■ 5. Use the Zero Theorem to find the solutions to the quadratic equation.

$$4x^2 - 16 = 0$$

■ 6. Use the Zero Theorem to find the solutions to the quadratic equation.

$$25 - 9x^2 = 0$$

COMPLETING THE SQUARE

■ 1. Solve for x by completing the square.

$$x^2 - 6x + 5 = 0$$

■ 2. Fill in the blank with the correct term.

$$x^2 - \underline{\quad} + \frac{9}{4} = -2 + \frac{9}{4}$$

■ 3. Complete the square but don't solve for the roots.

$$y^2 - 4y + 1 = 0$$

■ 4. Solve for y by completing the square.

$$y^2 + 3y = 1$$

■ 5. Solve for x by completing the square.

$$x^2 + 6x + 11 = 0$$

■ 6. Solve for x by completing the square.

$$2x^2 + 8x + 35 = 0$$

QUADRATIC FORMULA

■ 1. Write the quadratic formula for the following quadratic equation.

$x^2 - 5x - 24 = 0$

■ 2. What went wrong in the way the quadratic formula was applied?

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

$$x = \frac{-5 \pm \sqrt{(-5)^2 - 4(3)(10)}}{2(3)}$$

■ 3. Solve for z using the quadratic formula.

$z^2 = z + 3$

■ 4. Fill in the blank with the correct term if the quadratic formula below was built from the quadratic equation.

$\underline{\quad} x^2 + 3x - 5 = 0$

$$x = \frac{-3 \pm \sqrt{3^2 - 4(-2)(-5)}}{2(-2)}$$

■ 5. What went wrong if the quadratic formula below was built from the quadratic equation?

$$x^2 + 2x = 7$$

$$x = \frac{-2 \pm \sqrt{2^2 - 4(1)(7)}}{2(1)}$$

■ 6. Solve for t using the quadratic formula.

$$4t^2 - 1 = -8t$$

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