

DIRECTIONS: Simplify.

$$1. \frac{3^{-2}3^4}{3^5}$$
$$\frac{1}{27}$$

$$2. (4^{-2})^2$$
$$\frac{1}{256}$$

$$3. \frac{cd^3}{50} \cdot \frac{35c^5}{c^2d^2}$$
$$\frac{7c^4d}{10}$$

$$4. \left(\frac{h^4k^{-2}}{2k}\right)^{-3}$$
$$\frac{8k^9}{h^{12}}$$

$$5. (5x^2 - 3x + 7) - (4x^2 - 10x - 2)$$
$$x^2 + 7x + 9$$

$$6. (2x - 3)(x^2 - x + 4)$$
$$2x^3 - 5x^2 + 11x - 12$$

$$7. (3w + 7)(3w - 7)$$
$$9w^2 - 49$$

$$8. (m + 5)^3$$
$$m^3 + 15m^2 + 75m + 125$$

$$9. (3z + 4)^2$$
$$9z^2 + 24z + 16$$

$$10. (y + 1)(y - 5)(y + 6)$$
$$y^3 + 2y^2 - 29y - 30$$

DIRECTIONS: Factor completely.

$$11. 6x^2 + x - 2$$
$$(3x + 2)(2x - 1)$$

$$12. 10y^2 - 19y + 6$$
$$(2y - 3)(5y - 2)$$

$$13. 27a^3 - 8$$
$$(3a - 2)(9a^2 + 6a + 4)$$

$$14. 20x^4 - 23x^3 + 6x^2$$
$$x^2(5x - 2)(4x - 3)$$

$$15. 121x^2 - 1$$
$$(11x + 1)(11x - 1)$$

$$16. xy - 2y - x + 2$$
$$(x - 2)(y - 1)$$

$$17. 8y^3 + 1$$
$$(2y + 1)(4y^2 - 2y + 1)$$

$$18. 9c^2 + 30c + 25$$
$$(3c + 5)^2$$

$$19. pq - 2q + 2p - 4$$
$$(p - 2)(q + 2)$$

$$20. 4x^4y^2 + 4x^2y + 1$$
$$(2x^2y + 1)^2$$

$$21. 6x^2 + 35x - 6 \\ (x + 6)(6x - 1)$$

$$23. x^6 + y^3 \\ (x^2 + y)(x^4 - x^2y + y^2)$$

$$25. 4x^2 - 28x + 49 \\ (2x - 7)^2$$

$$27. x^2 + 4x - 12 \\ (x + 6)(x - 2)$$

$$29. x^3 - x^2 + 4x - 4 \\ (x - 1)(x^2 + 4)$$

$$31. x^4 + 5x^2 - 24 \\ (x^2 + 8)(x^2 - 3)$$

$$22. 20x^3 - 32x^2 + 12x \\ 4x(5x - 3)(x - 1)$$

$$24. x^4 - 16 \\ (x + 2)(x - 2)(x^2 + 4)$$

$$26. 4xy + 1 - 2x - 2y \\ (2y - 1)(2x - 1)$$

$$28. 250y^2 - 2y^5 \\ 2y^2(5 - y)(25 + 5y + y^2)$$

$$30. 16x^4 - 81 \\ (2x - 3)(2x + 3)(4x^2 + 9)$$

DIRECTIONS: Find the real number solutions of the equations.

$$32. x^3 + 6x^2 - 4x - 24 = 0 \\ x = -6, -2, 2$$

$$33. x^3 - 8 = 0 \\ x = 2$$

$$34. 12x^2 + 12x - 45 = 0 \\ x = -\frac{5}{2}, \frac{3}{2}$$

$$35. x^3 + 4x^2 = 7x + 28 \\ x = -4, -\sqrt{7}, \sqrt{7}$$