

Factor completely.

$$1. 32x^3 - 48x^2$$

$$16x^2(2x - 3)$$

$$2. x^2 - 81$$

$$(x+9)(x-9)$$

$$3. x^2 + 6x + 9$$

$$(x+3)^2$$

$$4. m^2 - 8m + 16$$

$$(m-4)^2$$

$$5. a^2 + 10a + 21$$

$$(a+7)(a+3)$$

$$6. 3x^2 - 27$$

$$3(x^2 - 9)$$

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

$$7. x^2 + x - 20$$

$$(x+5)(x-4)$$

$$8. 2x^2 - x - 3$$

$$(2x-3)(x+1)$$

$$9. m^2 - 9m + 18$$

$$(m-6)(m-3)$$

$$10. 6x^2 - 19x + 15$$

$$(2x-3)(3x-5)$$

$$11. 12 - x - x^2$$

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

$$12. 10x^2 - x - 3$$

$$(2x+1)(5x-3)$$

$$13. 4x^3 + 32$$

$$4(x^3 + 8)$$

$$4(x+2)(x^2 - 2x + 4)$$

$$14. b(a-4) + 5(a-4)$$

$$(a-4)(b+5)$$

$$15. 1 - 27x^3$$

$$(1-3x)(1+3x+9x^2)$$

$$16. 2x^2 + xy - 3y^2$$

$$(2x+3y)(x-y)$$

$$17. 7x^4 - 28x^2$$

$$7x^2(x^2 - 4)$$

$$7x^2(x+2)(x-2)$$

$$18. 15x^2 + 8x - 12$$

$$(5x+6)(3x-2)$$

$$19. 3x^2 - 24x + 48$$

$$3(x^2 - 8x + 16)$$

$$3(x-4)^2$$

$$22. x^3 - 16x^2 + 64x$$

$$x(x^2 - 16x + 64)$$

$$x(x-8)^2$$

$$25. x^4 - 26x^2 + 25$$

$$(x^2 - 1)(x^2 - 25)$$

$$(x+1)(x-1)(x+5)(x-5)$$

$$28. 343 - 7(x+3)^2$$

$$7(49 - (x+3)^2)$$

$$7(7+x+3)(7-(x+3))$$

$$7(10+x)(4-x)$$

$$31. a^2 - b^2 - 4b - 4$$

$$a^2 - (b^2 + 4b + 4)$$

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

$$(a+b+2)(a-b-2)$$

$$34. 5x^3 + 6x^2 - 45x - 54$$

$$x^2(5x+6) - 9(5x+6)$$

$$(x^2-9)(5x+6)$$

$$(x+3)(x-3)(5x+6)$$

$$20. x^2 - y^2 + 7y - 7x$$

$$(x+y)(x-y) + 7(y-x)$$

$$(x+y)(x-y) - 7(x-y)$$

$$(x-y)(x+y-7)$$

$$23. 3x^2 - 16x + 13$$

$$(3x-13)(x-1)$$

$$26. \sqrt{7x^3 - 14x^2 - 3x + 6}$$

$$7x^2(x-2) - 3(x-2)$$

$$(7x^2-3)(x-2)$$

$$29. 3x^2 - 16x + 13$$

$$(3x-13)(x-1)$$

$$32. x^2 - 4x + 4 - 100a^2$$

$$(x-2)^2 - 100a^2$$

$$(x-2+10a)(x-2-10a)$$

$$35. 60x^2 - 68x + 8$$

$$4(15x^2 - 17x + 2)$$

$$4(15x-2)(x-1)$$

$$21. x^6 + 64$$

$$(x^2+4)(x^4-4x^2+16)$$

$$24. x^2 + 11x + 18$$

$$(x+2)(x+9)$$

$$27. 81x^2 + 108x + 36$$

$$9(9x^2 + 12x + 4)$$

$$9(3x+2)(3x+2)$$

$$9(3x+2)^2$$

$$30. x^2 - 10x + 25 - y^2$$

$$(x-5)^2 - y^2$$

$$(x-5+y)(x-5-y)$$

$$33. 81 - x^2 + 2xy - y^2$$

$$81 - (x^2 - 2xy + y^2)$$

$$81 - (x-y)^2$$

$$(9+x-y)(9-x+y)$$

$$36. x^2 - 14x + 49 - 9y^2$$

$$(x-7)^2 - 9y^2$$

$$(x-7+3y)(x-7-3y)$$