Simplify the given radical expressions.

1. $\sqrt[5]{160}$　　　　2. $\sqrt[4]{810}$　　　　3. $4\sqrt[3]{500}$　　　　4. $-2\sqrt[3]{32}$　　　　5. $3\sqrt[4]{6250}$

Rewrite each rational exponent into a radical expression. Then, simplify.

6. $15^{\frac{4}{3}}$　　　　7. $20^{\frac{3}{2}}$　　　　8. $5^{\frac{7}{6}}$　　　　9. $9^{\frac{3}{2}}$　　　　10. $10^{\frac{6}{5}}$

Simplify the following expressions. Your expressions should only contain positive exponents.

11. $\dfrac{-6a^{-2}b^7}{-8c^3d^{-5}}$　　　　12. $\dfrac{10a^0b^5}{4c^{-4}d^6}$　　　　13. $\dfrac{3a^{-2}b^{-5}}{9c^4d^7}$　　　　14. $\dfrac{-12a^{-2}b^0}{9c^{-8}d^{-4}}$

15. $\left(\dfrac{10a^{-2}b^7}{4c^3d^{-5}}\right)^0$　　　　16. $-2a^{-3}b^0c^4d^{-5}$　　　　17. $3a^0b^{-4}c^5d^{-5}$

Write each number in scientific notation.

18. 0.0000653　　　　19. 27,958　　　　20. 0.00000291　　　　21. 8,162,384

Write each number in standard notation.

22. 6.853×10^5　　　　23. 2.947×10^{-4}　　　　24. 3.87×10^6　　　　25. 9.132×10^{-3}

Order the numbers in order from least to greatest.

26. 2.3×10^{-3}, 2.5×10^{-5}, 2.8×10^{2}, 2.1×10^{4}, 2.4×10^{-1}

27. 5.4×10^{7}, 7.9×10^{-2}, 6.3×10^{-4}, 3.2×10^{0}, 1.3×10^{3}

Simplify. (Multiplication Property of Exponents)

28. $(2x^4 y^3 z^5)(5x^2 y^2 z^3)$

29. $(3a^5 b^{-7} c^3)(4a^2 b^{10} c^4)$

30. $(\frac{1}{2} x^{-9} y^{-4})(8x^5 y^5)$

31. $(\frac{1}{3} a^{-2} b^{-9})(15a^{-4} b^5)$

32. $(2x^3 y^4)(3x^4 z^2)(5x^2 y^3 z^5)$

Simplify. (Division Property of Exponents)

33. $\dfrac{15x^9 y^3}{20x^5 y^6}$

34. $\dfrac{-18x^4 y^9}{6x^{10} y^5}$

35. $\dfrac{-4x^8 y^9}{-6x^{10} y^3}$

36. $\dfrac{2x^{-4} y^4}{4x^6 y^{-5}}$

37. $\dfrac{4x^{-5} y^3}{12x^4 y^{10}}$

Simplify. (Power of a Power)

38. $\left(3x^3y^4\right)^4$ 　　　　39. $\left(2x^7y^5\right)^3$ 　　　　40. $\left(5x^{-4}y^3\right)^2$ 　　　　41. $\left(3x^{-4}y^5\right)^{-3}$

42. $\left(\dfrac{x^8y^5}{x^{11}y^4}\right)^4$ 　　　　43. $\left(\dfrac{x^{12}y^7}{x^7y^{12}}\right)^4$ 　　　　44. $\left(\dfrac{x^5y^8}{x^9y^3}\right)^{-2}$

Simplify. Put your answers in standard form. (Polynomial Operations).

45. $(3x^2 - 2x + 5) - (9x^2 + 4x - 6x^3)$ 　　　　46. $(x^3 + x^2 - 5x - 10) + (-5x^3 + 4x^2 + 7x - 8)$

47. $2ab(5a^3 + 3a^2b)$ 　　　　48. $(2x + 5)(3x - 7)$

49. $(3x - 5)^2$ 　　　　50. $(x^2 + 3x)(9x^2 - 6x - 5)$

51. Given a rectangle with width $(4x + 2xy)$ and with length $(3xy)$.

    a. Write a polynomial to represent the perimeter of the rectangle.

    b. Write a polynomial to represent the area of the rectangle.

52. Given a rectangle with width $(5xy + 2y)$ and with length $(7xy)$.

    a. Write a polynomial to represent the perimeter of the rectangle.

    b. Write a polynomial to represent the area of the rectangle.