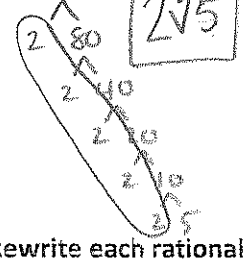
Key

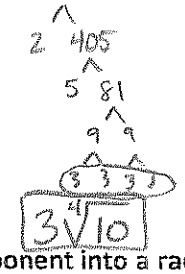
Algebra 1 – Unit 7 Review

Simplify the given radical expressions.

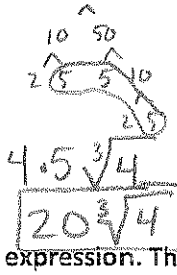
1. $\sqrt[5]{160}$ $2\sqrt[5]{5}$



2. $\sqrt[4]{810}$ $3\sqrt[4]{10}$

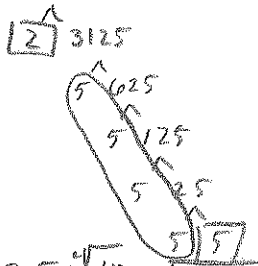


3. $4\sqrt[3]{500}$ $20\sqrt[3]{4}$



4. $-2\sqrt[3]{32}$ $-4\sqrt[3]{4}$

5. $3\sqrt[4]{6250}$ $15\sqrt[4]{10}$



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

6. $15^{\frac{4}{3}}$ $15\sqrt[3]{15}$

7. $20^{\frac{3}{2}}$ $40\sqrt{5}$

8. $5^{\frac{7}{6}}$ $5\sqrt[6]{5}$

9. $9^{\frac{3}{2}}$ 27

10. $10^{\frac{6}{5}}$ $10\sqrt[5]{10}$

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

11. $\frac{-6a^{-2}b^{7}}{-8c^{3}d^{-5}}$ $\frac{3b^7d^5}{4a^2c^3}$

12. $\frac{10a^{0}b^{5}}{4c^{-4}d^{6}}$ $\frac{5b^5c^4}{2d^6}$

13. $\frac{3a^{-2}b^{-5}}{9c^{4}d^{7}}$ $\frac{1}{3a^2b^5c^4d^7}$

14. $\frac{-12a^{-2}b^{0}}{9c^{-8}d^{-4}}$ $\frac{-4c^8d^4}{3a^2}$

15. $\left(\frac{10a^{-2}b^{7}}{4c^{3}d^{-5}}\right)^{0}$ 1

16. $-2a^{-3}b^{0}c^{4}d^{-5}$ $\frac{-2c^4}{a^3d^5}$

17. $3a^{0}b^{-4}c^{5}d^{-5}$ $\frac{3c^5}{b^4d^5}$

Write each number in scientific notation.

18. 0.0000653 6.53×10^{-5}

19. 27,958 2.7958×10^{4}

20. 0.00000291 2.91×10^{-6}

21. 8,162,384 8.162384×10^{6}

Write each number in standard notation.

22. 6.853×10^{5} 685,300

23. 2.947×10^{-4} .0002947

24. 3.87×10^{6} 3,870,000

25. 9.132×10^{-3} .009132

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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}

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

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

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

Simplify. (Multiplication Property of Exponents)

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

$10x^6y^5z^8$

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

$12a^7b^3c^7$

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

$4x^{-4}y = \frac{4y}{x^4}$

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

$5a^{-6}b^{-4} = \frac{5}{a^6b^4}$

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

$(6x^7y^4z^2)(5x^2y^3z^5)$

$30x^9y^7z^7$

Simplify. (Division Property of Exponents)

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

$\frac{3x^4}{4y^3}$

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

$\frac{-3y^4}{x^6}$

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

$\frac{2y^6}{3x^2}$

36. $\frac{2x^{-4}y^4}{4x^6y^{-5}} = \frac{1y^4y^5}{2x^4x^6} = \frac{y^9}{2x^{10}}$

37. $\frac{4x^{-5}y^3}{12x^4y^{10}} = \frac{1}{3x^4x^5y^7} = \frac{1}{3x^9y^7}$

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Simplify. (Power of a Power)

38. $(3x^3y^4)^4$ $3^4x^{12}y^{16}$ $81x^{12}y^{16}$

39. $(2x^7y^5)^3$ $2^3x^{21}y^{15}$ $8x^{21}y^{15}$

40. $(5x^{-4}y^3)^2$ $5^2x^{-8}y^6$ $25y^6$ / x^8

41. $(3x^{-4}y^5)^{-3}$ $3^{-3}x^{12}y^{-15} = \frac{x^{12}}{27y^{15}}$

42. $\left(\frac{x^8y^5}{x^{11}y^4}\right)^4$ $\left(\frac{y}{x^3}\right)^4 = \frac{y^4}{x^{12}}$

43. $\left(\frac{x^{12}y^7}{x^7y^{12}}\right)^4$ $\left(\frac{x^5}{y^5}\right)^4 = \frac{x^{20}}{y^{20}}$

44. $\left(\frac{x^5y^8}{x^9y^3}\right)^{-2}$ $= \left(\frac{y^5}{x^4}\right)^{-2} = \left(\frac{x^4}{y^5}\right)^2 = \frac{x^8}{y^{10}}$

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

45. $(3x^2-2x+5)-(9x^2+4x-6x^3)$ $3x^2-2x+5-9x^2-4x+6x^3$ $6x^3-6x^2-6x+5$

46. $(x^3+x^2-5x-10)+(-5x^3+4x^2+7x-8)$ $-4x^3+5x^2+2x-18$

47. $2ab(5a^3+3a^2b)$ $10a^4b+6a^3b^2$

48. $(2x+5)(3x-7)$ $6x^2-14x+15x-35$ $6x^2+x-35$

49. $(3x-5)^2$ $(3x-5)(3x-5)$ $9x^2-15x-15x+25$ $9x^2-30x+25$

50. $(x^2+3x)(9x^2-6x-5)$ $9x^4-6x^3-5x^2+27x^3-18x^2-15x$ $9x^4+21x^3-23x^2-15x$

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

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

$P = 2(4x+2xy) + 2(3xy)$

$P = 8x + 4xy + 6xy$

$\boxed{P = 8x + 10xy}$

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

$A = \ell \cdot w$

$A = (3xy)(4x + 2xy)$

$\boxed{A = 12x^2y + 6x^2y^2}$

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

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

$P = 2(5xy + 2y) + 2(7xy)$

$= 10xy + 4y + 14xy$

$\boxed{P = 24xy + 4y}$

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

$A = \ell \cdot w$

$A = (7xy)(5xy + 2y)$

$\boxed{A = 35x^2y^2 + 14xy^2}$