

1.7 Reviewing the Exponent Laws

MATHPOWER™ 10, Western Edition, pp. 30-33

Evaluate.

1. $4^{-2} = \frac{1}{16}$
2. $3^0 = 1$
3. $-(-2)^{-2} = -\frac{1}{4}$
4. $\frac{1}{(-5)^{-2}} = 25$

Simplify.

5. $a^3 \times a^4 \times a = a^8$
6. $(x^{-3})(x^{-2})(x^5) = x^0 = 1$
7. $y^0 \times y^2 \times y = y^3$
8. $(b^5)(b^{-7}) = b^{-2} = \frac{1}{b^2}$
9. $z^6 \div z^3 = z^3$
10. $m^5 \div m^{-3} = m^8$
11. $x^3 \div x^0 = x^3$
12. $y^{-4} \div y^2 = y^{-6} = \frac{1}{y^6}$

Simplify.

13. $(x^2)^5 = x^{10}$
14. $(z^{-3})^3 = z^{-9} = \frac{1}{z^9}$
15. $5a^{-2} = \frac{5}{a^2}$
16. $(a^3b^2)^{-2} = a^{-6}b^{-4} = \frac{1}{a^6b^4}$
17. $(w^{-4})^0 = 1$
18. $3a^0 = 3$
19. $\left(\frac{y}{3}\right)^2 = \frac{y^2}{9}$
20. $\left(\frac{n^2}{m}\right)^{-3} = \frac{m^3}{n^6}$
21. $\left(\frac{b^4}{c^6}\right)^3 = \frac{b^{12}}{c^{18}}$
22. $\left(\frac{x^{-4}}{y^{-2}}\right)^{-3} = \frac{x^{12}}{y^6}$

Simplify.

23. $(2ab^4)(3a^3bc) = 6a^4b^5c$
24. $(-3x^4y^2)(-8x^3y^4) = 24x^7y^6$
25. $(3a^2b)(-5a^4b^2) = -15a^6b^3$
26. $(2m^{-2}n)(3m^3n^3) = 6m^4n^4$
27. $(-6x^2y^{-3})(-2x^{-4}y^{-3}) = 12x^{-2}y^{-6} = \frac{12}{x^2y^6}$
28. $(-2a)(ab^2)(4a^{-4}b^{-5}) = -8a^{-2}b^{-3} = \frac{-8}{a^2b^3}$

Simplify.

29. $\frac{48a^3b^4}{6a^2b} = 8ab^3$
30. $\frac{(8x^{-2}y^2)(-3x^{-1}y^3)}{4x^{-5}y} = \frac{-24x^{-3}y^5}{4x^{-5}y} = -6x^2y^4$
31. $(42m^3n^{-3}) \div (-14m^7n^{-5}) = -3m^{-4}n^2 = \frac{-3n^2}{m^4}$
32. $\frac{-72x^{-8}y^{-5}}{-9x^{-4}y^{-5}} = \frac{8x^{-4}y^0}{x^4} = \frac{8}{x^4}$

Simplify.

33. $(3x^4)^2 = 9x^8$
34. $(-5y^3)^2 = 25y^6$
35. $(2c^{-2}d^{-4})^3 = 8c^{-6}d^{-12} = \frac{8}{c^6d^{12}}$
36. $(4m^3n^{-2})^{-2} = \frac{n^4}{16m^6}$
37. $\left(\frac{6w}{5z}\right)^2 = \frac{36w^2}{25z^2}$
38. $\left(\frac{4b^3}{-2a^2}\right)^{-3} = \left(\frac{-2b^3}{a^2}\right)^{-3} = \frac{a^6}{8b^9}$
39. $\left(\frac{8xy^3}{4xy}\right)^4 = (2y^2)^4 = 16y^8$
40. $\left(\frac{2m^{-3}n^2}{6m^2n^2}\right)^{-2} = \left(\frac{6m^2n^2}{2m^{-3}n^2}\right)^2 = \frac{3m^4n^4}{m^{-3}n^2} = 3m^7n^2$

Evaluate.

41. $5^{-1} + 3^{-1} = \frac{1}{5} + \frac{1}{3} = \frac{8}{15}$
42. $6(x^0 + y^0)^2 = 6(2)^2 = 24$
43. $\frac{4^{-2} + 4^{-1}}{4^{-2}} = \frac{\frac{1}{16} + \frac{1}{4}}{\frac{1}{16}} = \frac{\frac{5}{16}}{\frac{1}{16}} = 5$
44. $\frac{(5^2)^0}{(5^4 - 5^3)^{-1}} = \frac{1}{(625 - 125)^{-1}} = 500$