

$5a^{-2} + \frac{1}{5}a^{-2}$

- diff. btwn  $(2a)^6$   
- also  $-5 \neq \frac{1}{5}$  &  $2a^6$

### 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.  $(b^5)(b^{-7})$   $\frac{1}{b^2}$

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.  $y^{-4} \div y^2$   $\frac{1}{y^6}$

Simplify.

13.  $(x^2)^5$   $x^{10}$

14.  $(z^{-3})^3$   $z^{-9}$

15.  $5a^{-2}$   $\frac{5}{a^2}$

16.  $(a^3b^2)^{-2}$   $\frac{1}{a^6b^4}$

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.  $(2m^{-2}n)(3m^3n^3)$   $6mn^4$

27.  $(-6x^2y^{-3})(-2x^{-4}y^{-3})$   $12x^{-2}y^{-6}$  or  $\frac{12}{x^2y^6}$

28.  $(-2a)(ab^2)(4a^{-4}b^{-5})$   $-8a^{-2}b^{-3}$

Simplify.

29.  $\frac{48a^3b^4}{6a^2b}$   $8ab^3$

30.  $\frac{(8x^{-2}y^2)(-3x^{-1}y^3)}{4x^{-5}y}$   $= \frac{6x^{-3}y^5}{x^{-5}y} = -6x^2y^4$

31.  $(42m^3n^{-3}) \div (-14m^7n^{-5}) = -3m^{-4}n^2$

32.  $\frac{-72x^{-8}y^{-5}}{-9x^{-4}y^{-5}} = 8x^{-4}$  or  $\frac{8}{x^4}$

Simplify.

33.  $(3x^4)^2$   $9x^8$

34.  $(-5y^3)^2$   $25y^6$

35.  $(2c^{-2}d^{-4})^3$   $8c^{-6}d^{-12}$

36.  $(4m^3n^{-2})^{-2}$   $\frac{n^4}{16m^6}$

37.  $\left(\frac{6w}{5z}\right)^2$   $\frac{36w^2}{25z^2}$

38.  $\left(\frac{4b^3}{-2a^2}\right)^{-3}$   $-\frac{a^6}{8b^9}$

39.  $\left(\frac{8xy^3}{4xy}\right)^4$   $16y^8$

40.  $\left(\frac{2m^{-3}n^2}{6m^2n^2}\right)^{-2} = 9m^{10}$

Evaluate.

41.  $5^{-1} + 3^{-1}$

42.  $6(x^0 + y^0)^2$

43.  $\frac{4^{-2} + 4^{-1}}{4^{-2}}$

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

# 1.8 Rational Exponents

MATHPOWER™ 10, Western Edition, pp. 34-38

Write in radical form.

1.  $3^{\frac{1}{5}}$   $\sqrt[5]{3}$       2.  $6^{\frac{2}{3}}$       3.  $5^{-\frac{1}{2}}$   $\frac{1}{\sqrt{5}}$

4.  $x^{\frac{1}{4}}$       5.  $(3y)^{\frac{3}{2}}$   $\sqrt[2]{(3y)^3}$       6.  $m^{-\frac{4}{3}}$

Write using exponents.

7.  $\sqrt{6}$   $6^{\frac{1}{2}}$       8.  $\sqrt{3^5}$       9.  $\sqrt[4]{-14}$   $(-14)^{\frac{1}{4}}$

10.  $\sqrt[3]{m}$       11.  $(\sqrt{x})^3$   $x^{\frac{3}{4}}$       12.  $\frac{1}{(\sqrt[5]{y})^4}$

Evaluate.

13.  $49^{\frac{1}{2}}$  7      14.  $32^{\frac{1}{5}}$       15.  $-125^{\frac{1}{3}}$  -5

16.  $(16)^{-\frac{1}{4}}$   $\frac{1}{2}$       17.  $0.09^{\frac{1}{2}}$  0.3      18.  $256^{0.25}$  4

19.  $(\frac{25}{36})^{-\frac{1}{2}}$   $\frac{6}{5}$       20.  $(\frac{-64}{-8})^{-\frac{1}{3}}$  2

Evaluate.

21.  $9^{\frac{3}{2}}$  27      22.  $(-32)^{-\frac{3}{5}}$

23.  $4^{1.5}$  8      24.  $27^{-\frac{2}{3}}$   $\frac{4}{9}$

25.  $125^{\frac{2}{3}}$  25      26.  $(-1)^{\frac{4}{5}}$  -1

27.  $(\frac{25}{9})^{\frac{3}{2}}$   $\frac{125}{27}$       28.  $(\frac{64}{125})^{-\frac{2}{3}}$   $\frac{25}{64}$

Evaluate, if possible.

29.  $27^{-\frac{1}{3}}$   $\frac{1}{3}$       30.  $(-81)^{\frac{1}{2}}$  9i

31.  $1000^{\frac{2}{3}}$  1000      32.  $-8^{\frac{4}{3}}$  -64

33.  $36^{\frac{3}{2}}$  216      34.  $(-32)^{0.2}$

35.  $(\frac{25}{144})^{-\frac{1}{2}}$   $\frac{12}{5}$       36.  $(-1)^{-\frac{5}{2}}$  -1

37.  $-81^{-\frac{3}{4}}$   $\frac{1}{27}$       38.  $\frac{(0.008)^{-\frac{2}{3}}}{(0.36)^{-\frac{1}{2}}}$

39.  $\frac{(0.49)^{\frac{1}{2}}}{(0.027)^{\frac{1}{3}} \times 3^{-2}}$       40.  $\sqrt[3]{\sqrt{729}}$  3

Write an equivalent expression using exponents.

41.  $\sqrt[3]{\sqrt{64x^6}}$   $(64x^6)^{\frac{1}{6}}$       42.  $\sqrt{\sqrt{81x^4}}$   $(81x^4)^{\frac{1}{4}}$

43.  $(\frac{3}{a^2b^2})^4$       44.  $(\sqrt[4]{x^3})(\sqrt[3]{x})$   $x^{\frac{13}{12}}$

45.  $(\sqrt[4]{m^3n})^{\frac{1}{2}}$       46.  $(64x^9y^6)^{\frac{1}{3}}$   $4x^3y^2$

Evaluate, to the nearest hundredth.

47.  $4^{0.6}$       48.  $6^{-2.3}$       49.  $9^{\frac{2}{5}}$       50.  $8^{-\frac{3}{4}}$