

PRACTICE more exponents

PART A

1. Solve.

a) $5^x = 625$

c) $9^{x+1} = 27^{2x-3}$

e) $2^{3x} = \frac{1}{2}$

b) $4^{2x} = 2^{5-x}$

d) $8^{x-1} = \sqrt[3]{16}$

f) $4^{2x} = \frac{1}{16}$

5. Solve.

K a) $49^{x-1} = 7\sqrt{7}$

d) $36^{2x+4} = (\sqrt{1296})^x$

b) $2^{3x-4} = 0.25$

e) $2^{2x+2} + 7 = 71$

c) $\left(\frac{1}{4}\right)^{x+4} = \sqrt{8}$

f) $9^{2x+1} = 81(27^x)$

2. Solve. Round your answers to three decimal places.

a) $2^x = 17$

c) $30(5^x) = 150$

e) $5^{1-x} = 10$

b) $6^x = 231$

d) $210 = 40(1.5)^x$

f) $6^{\frac{x}{3}} = 30$

8. Solve for x .

a) $4^{x+1} + 4^x = 160$

d) $10^{x+1} - 10^x = 9000$

b) $2^{x+2} + 2^x = 320$

e) $3^{x+2} + 3^x = 30$

c) $2^{x+2} - 2^x = 96$

f) $4^{x+3} - 4^x = 63$

answers

1. a) 4 d) $\frac{13}{9}$
 b) 1 e) $-\frac{1}{3}$
 c) $\frac{11}{4}$ f) -1 5. a) 1.75 d) -4
2. a) 4.088 d) 4.092 b) $\frac{2}{3}$ e) 2 8. a) 2.5 d) 3
 b) 3.037 e) -0.431 c) -4.75 f) 2 b) 6 e) 1
 c) 1 f) 5.695 c) 5 f) 0

PART B

1. Rewrite each expression in an equivalent form, and then evaluate.

a) 5^{-2}

c) $36^{\frac{1}{2}}$

e) $-121^{\frac{1}{2}}$

b) 11^0

d) $125^{\frac{1}{3}}$

f) $\left(\frac{8}{27}\right)^{-\frac{2}{3}}$

10. Solve.

a) $5^x = 3125$

c) $4^{5x} = 16^{2x-1}$

b) $4^x = 16\sqrt{128}$

d) $3^{5x}9^{x^2} = 27$

2. Simplify each expression, and then evaluate.

a) $(3^5)(3^2)$

c) $\frac{10^9}{10^6}$

e) $(8^{\frac{1}{3}})^2$

b) $(-2)^{12}(-2)^{-10}$

d) $\frac{(7^6)(7^{-3})}{7^{-1}}$

f) $\frac{(4^{\frac{1}{3}})(4^{\frac{1}{4}})}{4^{\frac{1}{2}}}$

11. Solve. Express each answer to three decimal places.

a) $6^x = 78$

c) $8(3^x) = 132$

b) $(5.4)^x = 234$

d) $200(1.23)^x = 540$

3. Simplify.

a) $(2m)^3$

c) $(16x^6)^{\frac{1}{2}}$

e) $(-d^4)\left(\frac{c}{d}\right)^2$

b) $(a^4b^5)^{-2}$

d) $\frac{x^5y^2}{x^2y}$

f) $\left((x^3)^{-\frac{1}{3}}\right)^{-1}$

12. Solve.

a) $4^x + 6(4^{-x}) = 5$

b) $8(5^{2x}) + 8(5^x) = 6$

answers

1. a) $\frac{1}{5^2} = \frac{1}{25}$ d) $\sqrt[3]{125} = 5$
 b) 1 e) $-\sqrt{121} = -11$
 c) $\sqrt{36} = 6$ f) $\left(\sqrt[3]{\frac{27}{8}}\right)^2 = \frac{9}{4}$
2. a) $3^7 = 2187$ d) $7^4 = 2401$
 b) $(-2)^2 = 4$ e) $8^{\frac{2}{3}} = 4$ 10. a) 5 c) -2
 c) $10^3 = 1000$ f) $\frac{1}{4^{\frac{1}{2}}} = \sqrt{4} = 2$ b) 3.75 d) ~~none~~ 0.5 or -3
3. a) $8m^3$ d) x^3y 11. a) 2.432 c) 2.553
 b) $\frac{1}{a^8b^{10}}$ e) $-d^2c^2$ b) 3.237 d) 4.799
 c) $4|x|^3$ f) x 12. a) 0.79; 0.5 b) -0.43