

# Exponents 10

Review of exponent laws.

$$a^0 = 1, \quad a^m \times a^n = a^{m+n}, \quad a^m/a^n = a^{m-n}, \quad (a^m)^n = a^{mn}.$$

Solving exponential equations.

example: solve for x;

$$3^{2x+8} = 9^{3x} \rightarrow 3^{2x+8} = (3^2)^{3x} \rightarrow 2x + 8 = 6x \rightarrow x = 2$$

Problems:

1) Evaluate the following. Write as a rational number.

a)  $7^0$       b)  $5^3$       c)  $10^{-2}$       d)  $4^{1/2}$       e)  $(1/2)^3$       f)  $(1/2)^{-3}$

g)  $27^{1/3}$       h)  $16^{-1/2}$       i)  $16^{3/2}$       j)  $(1/3)^{-2}$       k)  $(-8)^{1/3}$       l)  $-64^{2/3}$

2) Write as an exponent with a single base.

a)  $2^3 \times 2^{-5}$       b)  $5^7/5^{-4}$       c)  $(7^{-2})^3$       d)  $3^6 \times 9^{-2}$       e)  $10^{11}/5^{11}$

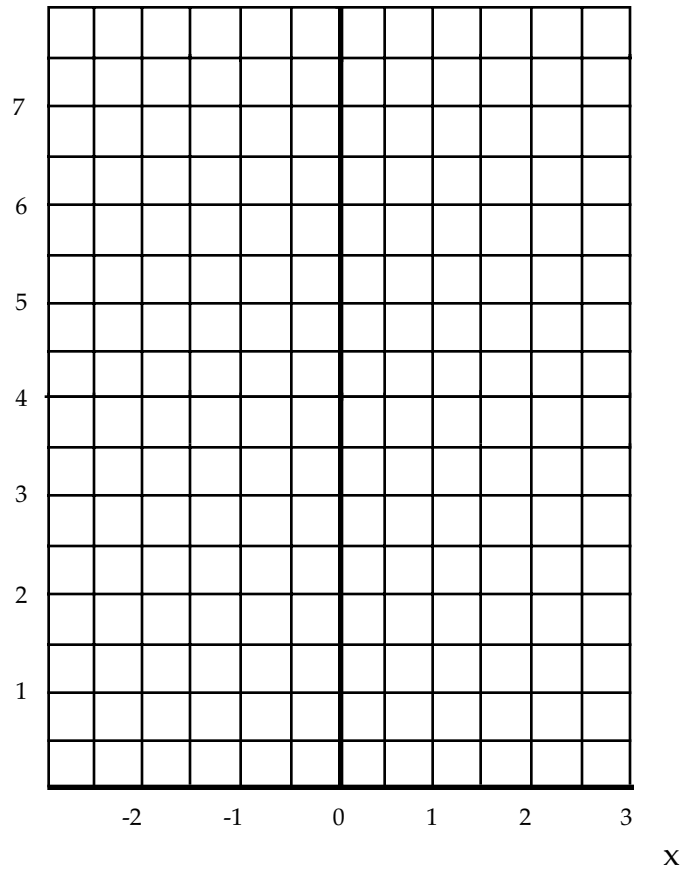
3) Solve the following equations for x.

a)  $2^x = 2^{-7}$                       b)  $5^x = 625$                       c)  $2^{3x-5} = 16$

d)  $7^x = 1/49$                       e)  $(1/10)^{x-2} = 10$                       f)  $25^{n-2} = 125^n$

4) Graph the functions;  $f(x) = 2^x$ , and  $f(x) = 2^{-x}$  on the grid below.

f(x)



Answers: 1)a) 1, b) 125, c)  $1/100$ , d) 2, e)  $1/8$ , f) 8, g) 3, h)  $1/4$ , i) 64, j) 9, k) -2, l) -16, 2)a)  $2^{-2}$ , b)  $5^{11}$ , c)  $7^{-6}$ , d)  $3^2$ , e)  $2^{11}$ , 3)a) -7, b) 4, c) 3, d) -2, e) 1, f) -4, 4)

