Exponential Form

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Mathematics 9
Exponents
Exponential Form

A. Definitions

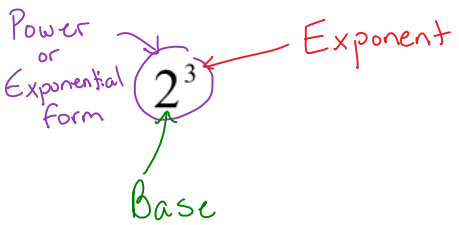
Base: the number which is multiplied by itself in an exponent question.

Exponent: the number of times you multiply the base number.

Power: a mathematical expression made up of a base and an exponent.

Exponential Form: a shortened way of writing a repeated multiplication question using a base and an exponent.

B. Evaluating Exponents



1. Solve the following exponents.

a) 3^2

$3 \times 3 = \boxed{9}$

b) -3^2

$3 \times 3 = \boxed{-9}$

c) $(-3)^2$

$(-3) \times (-3) = \boxed{9}$

d) $-(-3)^2$

$(-3) \times (-3) = \boxed{-9}$

e) $\left(\frac{1}{4}\right)^2$

$\left(\frac{1}{4}\right) \times \left(\frac{1}{4}\right) = \boxed{\frac{1}{16}}$

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

$\left(-\frac{2}{3}\right) \times \left(-\frac{2}{3}\right) \times \left(-\frac{2}{3}\right) = \boxed{-\frac{8}{27}}$

2. Write the following in exponential form and then evaluate the power.

a) $2\times2\times2\times2\times2\times2\times2$

2^7 or 128

b) $5\times5\times5$

5^3 or 125

c) $\left(\frac{1}{3}\right)\times\left(\frac{1}{3}\right)\times\left(\frac{1}{3}\right)\times\left(\frac{1}{3}\right)$

$\left(\frac{1}{3}\right)^4$ or $\frac{1}{81}$

d) $-6\times6\times6\times6$

-6^4 or -1296

3. Rewrite each exponential form as a product of powers and then evaluate.

a) 4^3

$4\times4\times4$ or 64

b) 3^4

$3\times3\times3\times3$ or 81

c) -2^5

$-2\times2\times2\times2\times2$ or -32

d) $(-2)^6$

$(-2)\times(-2)\times(-2)\times(-2)\times(-2)\times(-2)$ or 64

4. Arrange the following powers in descending order. High to Low

$2^4,\ 7^2,\ -5^2,\ -(-3)^3,\ (-4)^3$

$16, 49, -25, 27, -64$

$7^2, -(-3)^3, 2^4, -5^2, (-4)^3$

Assignment: Exponential Form Assignment

Name:_____

Exponential Form Assignment

1. Put the following exponents in order from smallest to largest.

a) $3^2,\ (-2)^3,\ -4^2,\ 2^3$

b) $-(-3)^2,\ 3^2,\ 1^5,\ (-1)^5$

2. Write the following in exponential form.

a) $3\times3\times3\times3\times3$

b) $(-5)\times(-5)\times(-5)$

c) $-(-10)\times(-10)\times(-10)\times(-10)$

d) $\dfrac{2\times2\times2\times2\times2\times2\times2\times2\times2}{7\times7\times7\times7\times7}$

e) $\left(-\frac{3}{7}\right)\times\left(-\frac{3}{7}\right)\times\left(-\frac{3}{7}\right)$

f) $-\left(\frac{1}{2}\right)\times\left(\frac{1}{2}\right)\times\left(\frac{1}{2}\right)\times\left(\frac{1}{2}\right)\times\left(\frac{1}{2}\right)\times\left(\frac{1}{2}\right)$

2. Rewrite each exponential form as a product of powers.

a) $(-4)^3$

b) -6^6

b) 2^4

d) $\frac{3^3}{5^4}$

4. Solve the following.

a) 3^3

b) $(-2)^6$

c) -8^2

d) $-(-4)^4$

e) $\left(\frac{7}{10}\right)^2$

f) $\left(-\frac{1}{4}\right)^3$

g) $-\left(\frac{2}{3}\right)^4$

h) $-\left(-\frac{5}{8}\right)^3$

i) $\left(\frac{5}{6}\right)^3$

j) $\left(-\frac{3}{4}\right)^4$

Answers

1. a) $-4^2,\ (-2)^3,\ 2^3,\ 3^2$ b) $-(-3)^2,\ (-1)^5,\ 1^5,\ 3^2$

2. a) 3^5 b) $(-5)^3$

   c) $-(-10)^4$ d) $\frac{2^9}{7^5}$

   e) $\left(-\frac{3}{7}\right)^3$ f) $-\left(\frac{1}{2}\right)^6$

3. a) $(-4)\times(-4)\times(-4)$ b) $-6\times6\times6\times6\times6\times6$

   c) $2\times2\times2\times2$ d) $\frac{3\times3\times3}{5\times5\times5\times5}$

4. a) 27 b) 64

   c) -64 d) -256

   e) $\frac{49}{100}$ f) $-\frac{1}{64}$

   g) $-\frac{16}{81}$ h) $\frac{125}{512}$

   i) $\frac{125}{216}$ j) $\frac{81}{256}$