Lesson 2.1: What Is a Power?

1. Identify the base of each power.

a) 6^3 **b)** 2^7 **c)** $(-5)^4$ **d)** -7^0

6 2 -5 7

2. Use repeated multiplication to show why 3^5 is not the same as 5^3.

$3^5 = 3 \times 3 \times 3 \times 3 \times 3 = 243$

$5^3 = 5 \times 5 \times 5 = 125$

3. Complete this table.

Power	Base	Exponent	Repeated Multiplication	Standard Form
4^4	4	4	$4 \times 4 \times 4 \times 4$	256
$(-10)^3$	-10	3	$-10 \times -10 \times -10$	- 1000
$(-6)^2$	–6	2	-6×-6	36
1^5	1	5	1 × 1 × 1 × 1 × 1	1

4. Write each product as a power, then evaluate.

a) 6 × 6

$= 6^2$
$= 36$

b) 3 × 3 × 3 × 3 × 3 × 3

$= 3^6$
$= 729$

c) 10 × 10 × 10 × 10

$= 10^4$
$= 10000$

d) –(8 × 8 × 8) or $-(8)^3$ or $-(8^3)$

$= -8^3$
$= -512$

e) (–8)(–8)(–8)

$= (-8)^3$
$= -512$

f) –(–8)(–8)(–8)

$= -(-8)^3$
$= -(-512)$
$= 512$

5. Write each power as repeated multiplication, then evaluate.

a) 7^5

$= 7 \times 7 \times 7 \times 7 \times 7$
$= 16807$

b) 4^6

$= 4 \times 4 \times 4 \times 4 \times 4 \times 4$
$= 4096$

c) -9^3

$= -(9 \times 9 \times 9)$
$= -(729)$
$= -729$

d) $(-5)^5$

$= (-5)(-5)(-5)(-5)(-5)$
$= -3125$

6. Evaluate each power. For each power:

- Are the brackets needed?
- If your answer is yes, what purpose do the brackets serve?

$-6^5 = -(6\times6\times6\times6\times6) = -(7776)$
$= -7776$

a) $(-6)^5$

$= (-6)(-6)(-6)(-6)(-6)$
$= -7776$

yes!
brackets are needed to identify a negative base.

b) $-(6)^5$

$= -(6\times6\times6\times6\times6)$
$= -(7776)$
$= -7776$

No

c) $-(-6)^5$

$= -(-6\times-6\times-6\times-6\times-6)$
$= -(-7776)$
$= 7776$

Yes

d) (-6^5)

$= -(6\times6\times6\times6\times6)$
$= -(7776)$
$= -7776.$

NO

7. Predict whether each answer is positive or negative, then evaluate.

a) $(-3)^2$

$= (-3)(-3)$
$= 9$

b) $(-3)^3$

$= (-3)(-3)(-3)$
$= -27$

c) -3^2

$= -(3\times3)$
$= -(9)$
$= -9$

d) $-(-3)^3$

$= -(-3\times-3\times-3)$
$= -(-27)$
$= 27$

8. Is the value of -2^4 different from the value of $(-2)^4$? Explain.

Yes because with -2^4 the negative is applied to the whole power, with $(-2)^4$ the negative is applied to the base.

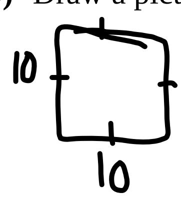
$-2^4 = -(2\times2\times2\times2) = -(16) = -16$ / $(-2)^4 = (-2)(-2)(-2)(-2) = 16$

9. Stamps are sold in a 10 by 10 sheet. The total value of a sheet of stamps is \$60.00.

a) Express the number of stamps as a power and in standard form.

10×10
$= 100$ (standard form).
$= 10^2$ (power).

b) Draw a picture to represent this power.



c) What is the value of one stamp?

$60 \div 100 = \$0.60$/stamp

per.