HW SOL 2.1

Name:_____   Date:_____

Math 9 Homework Section 1.1 What are Exponents

1. For each of the powers shown, please indicate the Base, Exponent, and the value of the power. Fill in all the missing information to complete the chart:

Power	Base	Exponent	Expanded Form	Value
5^4	5	4	$= 5 \times 5 \times 5 \times 5$	625
6^3	6	3	$= 6 \times 6 \times 6$	216
$(-4)^5$	(−4)	5	$= (-4) \times (-4)(-4)(-4)(-4)$	−1024
$-(5)^3$	5	3	$= - 5 \times 5 \times 5$	−125
3^6	3	6	$= 3 \times 3 \times 3 \times 3 \times 3 \times 3$	729
$7^4 \, \sim (-7)^4$	7	4	$7 \times 7 \times 7 \times 7 \sim (-7)(-7)(-7)(-7)$	2401
2^{10}	2	10	$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$	1024
$(-4)^5$	−4	5	$= (-4) \times (-4) \times (-4) \times (-4) \times (-4)$	−1024
-10^4	10	4	$= -(10) \times (10) \times (10) \times (10)$	−10000

2. Evaluate each of the following:

a) 3^3 = 27	b) -4^3 = −64	c) $(-6)^4$ = 1296	d) 3^5 = 243
e) 5^3 = 125	f) 2^6 = 64	g) $(-2)^6$ = 64	h) $(-7)^3$ = −343
i) -3^6 −729	j) $(-10)^8$ = 100 000 000	k) 5^4 = 5×5×5×5 = 625	l) 9^4 6561
m) 12^3 1728	n) -20^4 = −160000	o) $(-20)^4$ = 160000	p) 8^0 = 1

1

$3^4 = 81$
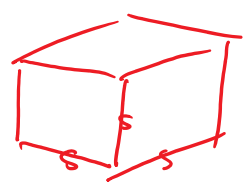$4^4 = 256$
$5^4 = 625$
$7^4 =$
$(-7)^4 =$

$2^1 = 2$
$2^2 = 4$
$2^3 = 8$
$2^4 = 16$
$2^5 = 32$
$2^6 = 64$
$2^7 = 128$
$2^8 = 256$
$2^9 = 512$
$2^{10} = 1024$
$2^{11} = 2048$
$2^{12} = 4096$

$2401 = 7^4$
$= (-7)^4$

6^3

$SA = Vol.$
$s \times s \times 6 = s \times s \times s$
$6 = s$
$V = 6 \times 6 \times 6$

3. Evaluate each of the following without a calculator:

a) $(-1)^8$ 1	b) $-(-1)^{12}$ -1	c) $-(-1)^5$ 1	d) $-(-1)^3 \times (-1)^4$ 1
e) $-(1)^{20}$ -1	f) $-(-1)^6 \times (-1)^6$ -1	g) $(-1)^5 \times -(-1)^3$ -1	h) $(-1)^{101}$ -1
i) $(-8)^0 \times -1^2(-1)^4$ -1	j) $-(-10)^0 \times (-10)^2$ -100	k) $?^6 = 64$ $? = 2$	l) $(-4)^3$ -64

4. Suppose the population of rats double every 4 days. If a house began with 4 rats on day 1, how many rats will there be after four months?

$$F = I \times N^{\frac{A}{L}}$$

30 31 30 31 = 122 days

I: initial # 4 rats → I = 4

N: increase amount Doubling ⟹ N = 2

L: Lifetime Q: How long it takes to double L = 4

A: How many days passed.
4 months A = 122

$$F = 4 \times 2^{\frac{122}{4}}$$

$$F = 4 \times 2^{30.5}$$

$$F = 6,074,001,000$$

5. List the following from the greatest to the least : $2^5, 3^4, 5^3, 6^2, 7^2$

$2^5 = 32$ $6^2 = 36$

$3^4 = 81$ $7^2 = 49$

$5^3 = 125$

$5^3, 3^4, 7^2, 6^2, 2^5$

6. If Bill Gates offered you two different jobs at his company with very similar responsibilities, which one will you take? Job A gets paid $1500 every day. Job B gets paid $0.01 on the first day, $0.02 on the second, $0.04 on the third, and doubles every day for the next 30days. Which job will you take? Which one will pay more and by how much?

Job A: Total salary = 30 × 1500
= 45,000 for 1st 30 days

Job B: salary on 30th day
$S = 0.01 \times 2^{30}$
= 10,737,418.24

7. Given that "a" and "b" are integers and $a^b = 64$, what are all the possible pairs of "a" and "b" that are possible? List them all out:

$2^6 = 64$ $8^2 = 64$ $(-2)^6 = 64$

$4^3 = 64$ $(-8)^2 = 64$ $\cancel{(-4)^3 = 64}$

$64^1 = 64$

$\cancel{\sqrt[6]{64}}$