

**Pre-algebra**  
**Skill-BUILDER # 1 – 5**  
**Exponentiation on Integers**

Use the fact that exponentiation is repeated multiplication and apply the multiplication rules.  
Again note that

***An odd number of negative factors gives a negative product.***  
***An even number of negative factors gives a positive product.***

Examples

1)  $(-2)^3 = (-2)(-2)(-2) = -8$

2)  $(-3)^4 = (-3)(-3)(-3)(-3) = 81$

3)  $(-1)^8 = (-1)(-1)(-1)(-1)(-1)(-1)(-1)(-1) = 1$

4)  $(-1)^{11} = (-1)(-1)(-1)(-1)(-1)(-1)(-1)(-1)(-1)(-1)(-1) = -1$

5)  $(-2)^4 = (-2)(-2)(-2)(-2) = 16$

6)  $-2^4 = -2 \cdot 2 \cdot 2 \cdot 2 = -16$

**Note:** In Example 5 the integer  $-2$  is raised to the exponent 4 and is thus multiplied to itself four times giving a positive result while in Example 6 the exponent 4 applies only to the integer 2 and thus 2 is multiplied four times and we take the opposite of the product giving a negative result.

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Perform the exponentiation.

1)  $(-2)^2$

2)  $-2^2$

3)  $-3^2$

4)  $(-3)^2$

5)  $(-4)^2$

6)  $-4^2$

7)  $-1^2$

8)  $(-1)^2$

9)  $(-6)^2$

10)  $-6^2$

11)  $(-3)^3$

12)  $-4^3$

13)  $(-5)^3$

14)  $(-1)^3$

15)  $(-2)^5$

16)  $-3^4$

17)  $(-3)^5$

18)  $-2^6$

19)  $(-1)^{16}$

20)  $(-1)^{31}$

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Answer Key:

1) 4

2) -4

3) -9

4) 9

5) 16

6) -16

7) -1

8) 1

9) 36

10) -36

11) -27

12) -64

13) -125

14) -1

15) -32

16) -81

17) -243

18) -64

19) 1

20) -1