

Note - Multiply and Divide Integers

Date - _____

There are many memory aids for figuring out the sign of the answer to a multiply or divide question. If you have forgotten the method taught to you in previous grades, then try this method.

- If there are 2 signs that are the same, the answer will be positive.
- If there are 2 signs that are different, the answer will be negative.

2 signs same \Rightarrow positive
2 signs different \Rightarrow negative

Multiplication Symbols

X • ()

Division Symbols

/ — $\frac{\cdot}{\cdot}$

Example 1: Evaluate using the times tables if necessary and using the "same - different" rule from above.

a) $(+3)(+7) = 21$

Same Sign = Pos.

b) $7(-2) = -14$

Different Sign = Neg.

c) $(-1)(+6) = -6$

Different Sign = Neg.

d) $(-3)(-4) = 12$

Same Sign = Pos.

e) $-1(+3)(-2) =$

$\swarrow \searrow$
 $-3(-2) = 6$

f) $(-2)(-4)(-6) =$

$\swarrow \searrow$
 $8(-6) = -48$

Example 2: We end up multiplying, as well, when evaluating exponents.

Eg. $2^5 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 32$

The exponent tells us how many times to multiply a number by itself. In our example we multiply 2 by itself, 5 times.

Remember, if the sign is inside the bracket, it is a part of the "base".

a) $(+3)^2 =$

$3 \cdot 3 = 9$

b) $(-2)^4 =$

$-2 \cdot -2 \cdot -2 \cdot -2 =$
 $\swarrow \searrow$
 $4 \cdot 4 = 16$

c) $-2^4 =$

$2 \cdot 2 \cdot 2 \cdot 2 = 16$
 $\swarrow \searrow$
 $4 \cdot 4 = 16$
 $\rightarrow -16$

bring the neg. down

e) $(-1)^{\text{even}} = 1$

even exponent = positive answer

d) $(-1)^3 =$

$-1 \cdot -1 \cdot -1 =$
 $\swarrow \searrow$
 $1 \cdot -1 = -1$

f) $(-1)^{\text{odd}} = -1$

odd exponent = negative answer

**Placement of the negative in regards to exponents DOES matter!

- Inside the parenthesis is included with the exponent. (Example B & D)
- Outside of parenthesis or no parenthesis, does not get included with the exponent. Bring it down to the final answer (Example C)

We don't always want to write out the expanded form of an exponent if the exponent is large. (example E and F) A rule to follow is that....

- If the exponent is an odd number the solution will be negative
- If the exponent is an even number the solution will be positive

Example 3: Now we will evaluate some "divide" questions and a few questions that will mix divide and multiply together.

a) $(-20) \div (-4) = +5$

b) $\frac{-6}{+3} = -2$

Different Sign = Neg.

c) $\frac{(-3)(+4)}{-6} = \frac{-12}{-6} = 2$

Same Sign = Pos.

d) $\frac{(-8)(-6)}{4(-3)} = \frac{48}{-12} = -4$

Different Sign = Neg.

HW - Multiply and Divide Integers (Academic)

(without a calculator)

Last Name - _____

Date Assigned - _____

1. Find each product. (There must be an equal sign between the question and the answer!)

a) $(-3)(+2) = -6$

Different Sign = Neg.

b) $(-4)(-9) = 36$

c) $(+4)(-3)$

d) $(-7)(-3) = 21$

Same Sign = Pos.

e) $(5)(+4) = 20$

f) $(-2)(7)$

2. Multiply.

a) $-2(-7) = 14$

Same Sign = Pos.

b) $-3(8) = -24$

c) $5(-7)$

d) $-5(-7) = 35$

Same Sign = Pos.

e) $-4(-9) = 36$

f) $-4(9)$

3. Find each quotient.

a) $-18 \div (-6) = 3$

Same Sign = Pos.

b) $-24 \div 6 = -4$

c) $51 \div (-17)$

d) $-42 \div (-14) = 3$

Same Sign = Pos.

e) $-18 \div (18) = -1$

f) $-24 \div (-6)$

g) $60 \div (-12) = -5$

Different Sign = Neg.

h) $-30 \div (-15) = 2$

4. Divide.

a) $\frac{-50}{5} = -10$

Different Sign = Neg.

b) $\frac{-15}{-5} = 3$

c) $\frac{30}{-6} =$

d) $\frac{48}{-6} = -8$

Different Sign = Neg.

e) $\frac{16}{-16} = -1$

f) $\frac{-16}{-8}$

g) $\frac{18}{-9} = -2$

Different Sign = Neg.

h) $\frac{-81}{27} = -3$

i) $\frac{-18}{-9}$

5. Evaluate. ****must show the expanded form!**

a) $(-4)^2 = -4 \cdot -4 = 16$

b) $(-2)^4 = -2 \cdot -2 \cdot -2 \cdot -2 = 16$

c) $(-3)^4 =$

d) $(-5)^2 = -5 \cdot -5 = 25$

e) $-5^2 = 5 \cdot 5 = 25$

f) -4^3

g) $(-4)^3 = -4 \cdot -4 \cdot -4$

$16 \cdot -4 = -64$

h) $(-2)^5 = -2 \cdot -2 \cdot -2 \cdot -2 \cdot -2 = -32$

i) $(-3)^2$

6. Evaluate.

a) $-1(-2)(+3) = 6$

2 negatives. 2 is Even,
Answer is positive.

d) $(+1)(-1)(+5)(-2) = 10$

2 negatives. 2 is Even,
Answer is positive.

b) $(+3)(-2)(+5) =$

-30

e) $(-3)(-1)(+2)(-7)$

-42

c) $(-3)(-2)(-6)$

f) $-1(-3)(+2)(-1)(+4)$

7. Evaluate:

a) $(+10)^5 = -100,000$

odd exponent =
negative answer

$-100,000,000$

b) $(-10)^7 =$

d) $(-1)^{20} = 1$

even exponent =
positive answer

e) $(-1)^{299} = -1$

odd exponent =
negative answer

c) $(+1)^{20}$

1

f) $(-1)^{500}$

1

8. Calculate. (2 steps each)

a) $\frac{(-2)(+8)}{(-4)} =$

$\frac{-16}{-4} = -4 \div +4$

b) $\frac{-40}{(-5)(-2)} =$

$\frac{-40}{10} = -4$

c) $\frac{8(-5)}{(-2)(-2)}$

d) $\frac{(-4)(+9)}{(-2)(+3)} \rightarrow \frac{-36}{-6} = 6$

e) $\frac{-10(-6)}{4(-5)}$

$\frac{60}{-20} = -3$

f) $\frac{(-10)(+6)}{(-3)(-2)}$

Let's Reflect Back

$(+)(+) = (+)$ $(-)(+) = (-)$ Rules for signed numbers
 $(-)(-) = (+)$ $(+)(-) = (-)$

MULTIPLYING & DIVIDING INTEGERS

Multiply or divide as indicated.

1. $6(-8)$ -48	2. $-5(-9)$ 45	3. $-63 \div (-9)$ 7	4. $-36 \div 9$ -4
5. $12(-6)$ -72	6. $(-4)(-9)$ 36	7. $(-5)(-3)(-1)(3)$ $\checkmark \quad \checkmark$ $15 \cdot -3$ \checkmark -45	8. $36 \div (-3)$ -12
9. $-48 \div (-6)$ 8	10. $\frac{63}{-9}$ fraction bars mean to divide $63 \div -7 = -9$	11. $(-\frac{3}{4})^2$ exponents mean to multiply by itself $(-\frac{3}{4})(-\frac{3}{4}) = \frac{9}{16}$	12. $3(-9)$ -27
13. $(-7)(-6)$ 42	14. $(-1)(-2)(-3)(-4)$ 24	15. $-42 \div 7$ -6	16. $-56 \div -8$ 7
17. $\frac{48}{-8}$ fraction bars mean to divide $48 \div (-8) = -6$	18. -5^2 exponents mean to multiply by itself $(-)(5)(5) = -25$	19. -6^2 exponents mean to multiply by itself $(-)(6)(6) = -36$	20. $(-4)^2$ exponents mean to multiply by itself $(-4)(-4) = 16$

PLACEMENT OF THE NEGATIVE AND PARENTHESIS MATTERS!!!