PRINCIPLES - LESSON 1C
MULTIPLYING & DIVIDING REAL NUMBERS

$2(4) = 8$

$2(3) = 6$

$2(2) = 4$

$2(1) = 2$

$2(0) = 0$

$2(-1) = -2$

$2(-2) = -4$

$2(-3) = -6$

FOLLOW THE PATTERN

WHAT DO YOU GET WHEN YOU MULTIPLY A POSITIVE BY A NEGATIVE?

MULTIPLYING A POSITIVE BY A NEGATIVE

POSITIVE • NEGATIVE = NEGATIVE

Simplify.

ex1) $3(-4) =$ -12

ex2) $-8 \cdot 5 =$ -40

ex3) $(-3.56)(0.4) =$ -1.424

WHAT DO YOU GET WHEN YOU DIVIDE ONE POSITIVE AND ONE NEGATIVE?

DIVIDING A POSITIVE AND A NEGATIVE

The sign rules for division are identical to the rules for multiplication. Dividing one positive and one negative also gives a negative.

Simplify.

ex4) $6 \div (-2) =$ -3

ex5) $\frac{-20}{4} =$ -5

MULTIPLYING OR DIVIDING TWO NEGATIVES

$-2(4) = -8$

$-2(3) = -6$

$-2(2) = -4$

$-2(1) = -2$

$-2(0) = 0$

$-2(-1) = 2$

$-2(-2) = 4$

$-2(-3) = 6$

FOLLOW THE PATTERN

WHAT DO YOU GET WHEN YOU MULTIPLY OR DIVIDE A NEGATIVE BY A NEGATIVE?

MULTIPLYING OR DIVIDING TWO NEGATIVES

NEGATIVE · NEGATIVE = POSITIVE

Simplify.

ex6) $-5\,(-8) =$ (40)

ex7) $\left(-3\frac{1}{2}\right)\left(-1\frac{1}{2}\right) = \frac{-7}{2} \cdot \frac{-3}{2} = \left(\frac{21}{4}\right)$

Reduced improper fractions are fine. No need to convert to a mixed number.

ex8) $\frac{-6}{-2} =$ (3)

DIVIDING TWO NEGATIVES ALSO GIVES A POSITIVE RESULT.

MULTIPLYING OR DIVIDING MORE THAN TWO NEGATIVES

What is the rule for multiplying or dividing more than two negative numbers?

$(-1)(-1) = 1$

$(-1)(-1)(-1) = -1$

$(-1)(-1)(-1)(-1) = 1$

$(-1)(-1)(-1)(-1)(-1) = -1$

$(-1)(-1)(-1)(-1)(-1)(-1) = 1$

MULTIPLYING OR DIVIDING MORE THAN TWO NEGATIVES

ex9) $3\,(-2)\,(-8)\,(9) =$ 432

(-2): 1 negative; (-8): 2 negatives

even number of negatives (+)

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ex10) $-6\,(-1)\,(4)\,(-3)\,(5) =$ -360

-6: 1 negative; (-1): 2 negatives; (-3): 3 negatives

odd number of negatives (-)

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ex11) $5\,(-3)\,(-6)\,(-10)\,(0)\,(4)\,(-14) =$ 0

0 ruins the whole thing

DIVISION AND ZERO

Try both of these problems in your calculator.

$\frac{0}{15}$ or $0 \div 15$

$= 0$

$\frac{15}{0}$ or $15 \div 0$

undefined

We can NEVER divide by zero.

PROPERTIES OF ZERO

1. Zero multiplied by anything is zero. $0 \cdot 27 = 0$

2. Zero divided BY anything is zero. $\frac{0}{27} = 0$

3. Anything divided BY ZERO is undefined. $\frac{27}{0}$ is undefined.