TOPIC 2





Signed Multiplication Facts

You can use patterns to analyze the signs of multiplication facts involving positive and negative numbers.

- Analyze the sequence of products with 4.
- 1 What pattern do you notice in the products as the numbers multiplied by 4 decrease?

(a) $4 \cdot (-1) = -4$

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

- · Look for and make use of structure.
- · Look for and express regularity in repeated reasoning.
 - $4 \cdot 4 = 16$

$$4 \cdot 2 = 8$$

$$4 \cdot 1 = 4$$

$$4 \cdot 0 = 0$$

$$(0.4 \cdot (-3) = -12$$

Describe the pattern(s) that you notice in the new products.

They are 4 less than the previous product.

- Analyze the sequence of products with -5.
- Describe the pattern and then extend it by writing the next three number sentences.

The product in creases by 5

$$-5 \cdot 5 = -25$$

$$-5 \cdot 4 = -20$$

$$-5 \cdot 3 = -15$$

$$-5 \cdot 2 = -10$$

$$-5 \cdot 0 = 0$$



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Look back at the products you have determined in this lesson to answer each question.



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- 6 Describe the sign of the product of each pair of integers.
 - (a) Two positive integers

(b) Two negative integers

positive

positive

- (c) One positive and one negative integer
- (d) One integer is zero

negative

When you know that the product of two integers is negative, what can you say about the two integers? Give examples.

The two integers have different signs.

Bescribe a rule that will help you multiply any two integers.

ASK YOURSELF...

Even # of negatives = positive

Does the order in which you multiply the integers matter?

odd # of negatives = negative

Use your rule to evaluate each expression.

$$\bigcirc -3 \cdot 2 \cdot (-4) = 24$$

$$6 \cdot (-5) = -30$$

$$-8 \cdot (-7) = 56$$

$$-3 \cdot (-2) \cdot (-4) = -24$$

$$-6.5 = -30$$

$$3 \cdot (-2) \cdot 4 = -24$$

$$-6 \cdot (-5) = 30$$

$$8.7 = 56$$

$$-3 \cdot (-2) \cdot 4 = 24$$

$$3 \cdot 2 \cdot (-4) = \frac{-24}{}$$

$$-3 \cdot 2 \cdot 4 = -24$$

$$-3 \cdot 2 \cdot 4 = -24$$





Same rules apply that

> Use fact families to help you determine each answer. were used for multiplication

3 Fill in the unknown numbers to make each number sentence true.

(d)
$$24 \div -3 = -8$$

(e)
$$32 \div (-8) = -4$$

$$(f)$$
 -105 ÷ 21 = -5

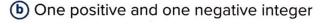
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$$0 \div (-8) = 0$$

(h)
$$-26 \div 26 = -1$$

- 4 Describe the sign of the quotient of each pair of integers.
 - Two positive integers

REMEMBER...

A quotient is the answer to a division problem.



© Two negative integers

d The dividend is zero

5 How do the answers to Question 4 compare to the answers to the same questions about the multiplication of two integers? **Explain your reasoning.**

