

Pre-algebra

Skill-BUILDER # 1 – 3

Multiplying Integers

We have the following rules for integer multiplication:

$$\begin{array}{ll} (+) \cdot (+) = (+) & \text{positive} \times \text{positive} = \text{positive} \\ (-) \cdot (-) = (-) & \text{negative} \times \text{negative} = \text{positive} \\ (+) \cdot (-) = (-) & \text{positive} \times \text{negative} = \text{negative} \\ (-) \cdot (+) = (-) & \text{negative} \times \text{positive} = \text{negative} \end{array}$$

Examples

1) $3 \cdot (-5) = -15$

2) $(-4)(-6) = 24$

3) $-7 \cdot 9 = -63$

4) $-(-3) \cdot (-2) = 3 \cdot (-2) = -6$

When multiplying more than two integers one can work from left to right:

5)

$$\begin{aligned} & \underbrace{4 \cdot (-2)} \cdot (-1) \cdot (-2) \\ = & \underbrace{-8 \cdot (-1)} \cdot (-2) \\ = & 8 \cdot (-2) \\ = & -16 \end{aligned}$$

6)

$$\begin{aligned} & \underbrace{(-3) \cdot 5} \cdot (-1) \cdot (-2) \cdot (-1) \\ = & \underbrace{-15 \cdot (-1)} \cdot (-2) \cdot (-1) \\ = & \underbrace{15 \cdot (-2)} \cdot (-1) \\ = & -30 \cdot (-1) \\ = & 30 \end{aligned}$$

Note: Example 5 has three negative factors and the product is negative, while example 6 has four negative factors and the product is positive.

We can generalize this to any number of negative factors:

The product of an odd number of negative factors is negative.

The product of an even number of negative factors is positive.

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Find the product.

1) $4 \cdot (-5)$

2) $-6 \cdot 5$

3) $-7 \cdot (-3)$

4) $-4 \cdot (-9)$

5) $(-5)(-8)$

6) $(-8)(-10)$

7) $(3)(-9)$

8) $(-6)(9)$

9) $6 \cdot (-3) \cdot (-2)$

10) $-5 \cdot (-2) \cdot (5)$

11) $8 \cdot (-1) \cdot (-2) \cdot (-2)$

12) $-4 \cdot 5 \cdot (-3) \cdot (-1)$

13) $-(-1)(2)(-3)(-2)$

14) $-(-4)(-1)(-2)(10)$

15) $2 \cdot (-5) \cdot (-1) \cdot (-2) \cdot (-1)$

16) $-4 \cdot 3 \cdot (-1) \cdot (-2) \cdot (-2) \cdot (-1)$

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Answer Key:

1) -20

2) -30

3) 21

4) 36

5) 40

6) 80

7) -27

8) -54

9) 36

10) 50

11) -32

12) -60

13) 12

14) 80

15) 20

16) -48