

Intro to college math: Chapter 1.5
Operations with Integers

Multiplication Rules for signs

$$\begin{array}{rclcl} + & \cdot & + & = & + \\ + & \cdot & - & = & - \\ - & \cdot & + & = & - \\ - & \cdot & - & = & + \end{array}$$

Division Rules for signs

$$\begin{array}{rcl} (+) \div (+) & = & (+) \\ (+) \div (-) & = & (-) \\ (-) \div (+) & = & (-) \\ (-) \div (-) & = & (+) \end{array}$$

* anything multiplied by 0 equals 0.

1. Use the rule of order of operations to simplify the expression as much as possible.

$$-4(-2)(-5)$$

$$\underline{-4}(\underline{-2})(-5)$$

$$8(-5)$$

$$\boxed{-40}$$

2. Use the rule of order of operations to simplify the expression as much as possible.

$$-1(-4)(-2)(-5)$$

$$\underline{-1}(\underline{-4})(-2)(-5)$$

$$\underline{4}(\underline{-2})(-5)$$

$$-8(-5)$$

$$\boxed{40}$$

← Since everything is multiplied, start with the left and work right

3. Use the rule for order of operations to simplify the expression as much as possible.

$$-4(7-8) - 6(2-3)$$

$$-4(\underline{7-8}) - 6(\underline{2-3})$$

$$-4(\underline{-1}) - 6(\underline{2-3})$$

$$\underline{-4(-1)} - 6(\underline{-1})$$

$$\underline{4} - 6(\underline{-1})$$

$$4 + 6 = \boxed{10}$$

← Begin with () 1st, from Left to right



← Then multiply Left to right



← Then add / subtract Left to right.

4. Use the rule for order of operations to simplify the expression as much as possible.

$$6 - 4[-4 - 2(-1)]$$

$$6 - 4[-4 - \underline{2(-1)}]$$

$$6 - 4[-4 + \underline{2}]$$

$$6 - 4[\underline{-2}]$$

$$6 + \underline{8} =$$

$$\boxed{14}$$

← Begin inside brackets with multiplication.

← Continue inside brackets with add / subtract

← multiply Left to right

← add / subtract Left to right.

5. Find the following quotient (divide): $\frac{15}{-3}$

$$\frac{15}{-3} = \boxed{-5}$$

Division Rules for Signs

$$\frac{(+)}{(+)} = (+)$$

$$\frac{(-)}{(-)} = (+)$$

$$\frac{(+)}{(-)} = (-)$$

$$\frac{(-)}{(+)} = (-)$$

6. Find the following quotient (divide): $\frac{-84}{-7}$

$$\frac{-84}{-7} = 12$$

7. The following problem involves more than one operation. Simplify as much as possible:

$$\begin{aligned} & \frac{3 - [(2 - 7) - 9]}{-6 - 5 - 2} \\ & \frac{3 - [\underline{2 - 7} - 9]}{-\underline{6} - \underline{5} - \underline{2}} \quad \leftarrow \text{do inside } () \text{ 1st on top} \\ & \frac{3 - [-5 - 9]}{-13} \quad \leftarrow \text{add/subtract left to right on bottom} \\ & \frac{3 - [-14]}{-13} \quad \leftarrow \text{combine inside } [] \\ & \frac{3 - [-14]}{-13} = -\frac{17}{13} \quad \leftarrow \text{add/subtract left to right} \end{aligned}$$

* Remember: 2 negatives beside each other make a (+)

8. The following problem involves more than one operation. Simplify as much as possible:

$$\begin{aligned} & \frac{8(-2) - 4(11 - 5)}{-3 - 5 - 4} \\ & \frac{8(-2) - 4(\underline{11 - 5})}{-\underline{3} - \underline{5} - \underline{4}} \\ & \frac{8(-2) - 4(\underline{6})}{-\underline{12}} \\ & \frac{-16 - 4(\underline{6})}{-\underline{12}} \\ & \frac{-16 - \underline{24}}{-12} = \frac{-40}{-12} = \frac{10}{3} \end{aligned}$$

To simplify a fraction:
• type into calculator using $\left(\frac{n}{d}\right)$ button.