

## 3.6

## Order of Operations with Rational Numbers

*Remember, all math is adding and subtracting numbers...in a certain order!*

**BEDMAS or PEDMAS**

Brackets

Exponents

Division / Multiplication

Addition / Subtraction

Example 1:

$$(-0.8) + 1.2 \div (-0.3) \times 1.5$$

$$-0.8 + (-4) \times 1.5$$

$$-0.8 + (-6)$$

$$\boxed{-6.8}$$

Example 2:

$$(-3.2) - 0.9 \div [0.7 + (+1.2)]^2$$

$$(-3.2) - 0.9 \div (1.9)^2$$

$$(-3.2) - 0.9 \div (3.61)$$

$$(-3.2) - 0.249 = \boxed{-3.449}$$

**Example 3:**

To convert a temperature in degrees Fahrenheit to degrees Celsius, we use the formula:

$$C = \frac{F - 32}{1.8}$$

In Fort Simpson, Northwest Territories, the mean temperature in December is  $-9.4^{\circ}\text{F}$ . What is this temperature in degrees Celsius?

**► A Solution**

Substitute  $F = -9.4$  into the formula:

$$\begin{aligned} C &= \frac{F - 32}{1.8} \\ &= \frac{-9.4 - 32}{1.8} \end{aligned}$$

The fraction bar indicates division, but also acts like brackets.

That is, the expression means  $C = (-9.4 - 32) \div 1.8$

So, simplify the numerator first, then divide.

$$\begin{aligned} C &= \frac{-9.4 - 32}{1.8} && \text{Subtract.} \\ &= \frac{-41.4}{1.8} && \text{Divide.} \\ &= -23 \end{aligned}$$

The mean temperature in December is  $-23^{\circ}\text{C}$ .

**Example 4:**

Evaluate.

$$\left(-\frac{1}{2}\right)\left(-\frac{1}{2}\right) - \left(-\frac{2}{3}\right) \div \left[\frac{1}{3} + \left(-\frac{3}{12}\right)\right]$$

**► A Solution**

$$\begin{aligned} & \left(-\frac{1}{2}\right)\left(-\frac{1}{2}\right) - \left(-\frac{2}{3}\right) \div \left[\frac{1}{3} + \left(-\frac{3}{12}\right)\right] \\ &= \left(-\frac{1}{2}\right)\left(-\frac{1}{2}\right) - \left(-\frac{2}{3}\right) \div \left[\frac{1}{3} - \frac{3}{12}\right] \\ &= \left(-\frac{1}{2}\right)\left(-\frac{1}{2}\right) - \left(-\frac{2}{3}\right) \div \left[\frac{4}{12} - \frac{3}{12}\right] \\ &= \left(-\frac{1}{2}\right)\left(-\frac{1}{2}\right) - \left(-\frac{2}{3}\right) \div \left(\frac{1}{12}\right) \\ &= \frac{1}{4} - \left(-\frac{2}{3}\right) \div \left(\frac{1}{12}\right) \\ &= \frac{1}{4} - \left(-\frac{2}{3}\right) \times \left(\frac{12}{1}\right) \\ &= \frac{1}{4} - \left(-\frac{2}{1}\right) \times \left(\frac{4}{1}\right) \\ &= \frac{1}{4} - (-8) \\ &= \frac{1}{4} + 8 \\ &= 8\frac{1}{4} \end{aligned}$$

## Practice Problems

Pg. 140 #s 4, 7, 8, 9, 10, 13, 17.

Begin review with the Study Guide & Practice Test on pages 143 - 146.