

Pre-Algebra

Essential Question: How do we evaluate numerical expressions with rational numbers?

Do Now: Simplify each numerical expression.

A.  $-1.5 + 3.5 + 2$

$-1.5 + 5.5$

$4$

B.  $1\frac{1}{2} - 3 + 2\frac{1}{2}$

$4 - 3$

$1$

C.  $-\frac{7}{12} + \frac{1}{6} + \frac{5}{12}$

$-\frac{7}{12} + \frac{2}{12} + \frac{5}{12}$

$-\frac{7}{12} + \frac{7}{12}$

$0$

Evaluating Numerical Expressions

1)  $\frac{1}{2} - \left(\frac{1}{2}\right)^2$

$\frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$

$2 \cdot \frac{1}{2} - \frac{1}{4}$

$2 \cdot 2 - \frac{1}{4}$

$\frac{2}{4} - \frac{1}{4}$

$\frac{1}{4}$

OR

$0.5 - 0.25$

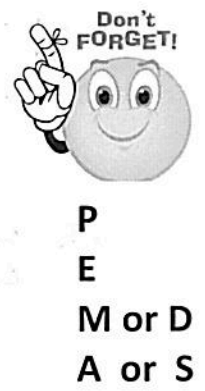
$0.25$

2)  $\left[1\frac{1}{5} + (-1.2)\right](-5)$

$[1.2 + (-1.2)](-5)$

$(0)(-5)$

$0$



3)  $-\frac{3}{7} \times 0.1 \div \frac{5}{21}$

$-\frac{3}{7} \times \frac{1}{10} \div \frac{5}{21}$

$-\frac{3}{70} \div \frac{5}{21}$

$-\frac{3}{70} \cdot \frac{21}{5}$

$-\frac{9}{50}$

4)  $\frac{-(-4)(-6) + \frac{3}{5}(15-20)}{-\frac{1}{5} \times 3}$

$15 - 20$   
 $15 + (-20)$   
 $-5$

$4(-6) + \frac{3}{5}(-5)$

$-\frac{1}{5} \times 3$

$-24 + (-3)$

$-\frac{3}{5}$

$-\frac{27}{-\frac{3}{5}}$

$9$

$45$

**IT'S YOUR TURN NOW**

$$5) \frac{1}{2} \left( -\frac{1.5}{2.5} + \frac{4}{5} \right) \cdot 2$$

$$\frac{1}{2} \left( -\frac{5}{10} + \frac{8}{10} \right)$$

$$\frac{1}{2} \left( \frac{3}{10} \right)$$

$$\frac{3}{20}$$

OR  $\frac{1}{2} \left( -\frac{1}{2} + \frac{4}{5} \right)$

$$5 \cdot -\frac{1}{4} + \frac{4}{10} \cdot 2$$

$$-\frac{5}{20} + \frac{8}{20}$$

$$\frac{3}{20}$$

OR  $0.5(-0.5 + 0.8)$

$$0.5(0.3)$$

$$0.15$$

$$6) -6 \div \frac{3}{10} \times 4.5$$

$$-2 \cdot \frac{6}{1} \cdot \frac{10}{3} \times 4.5$$

$$-20 \times 4.5$$

**-90**

$$4.5$$

$$\times 20$$

$$\hline 90.0$$

$$7) \frac{-5\frac{1}{2} \cdot 4}{2 \cdot \left( -\frac{7}{2} + \frac{1}{4} \right)}$$

$$\frac{-11 \cdot 4^2}{1 \cdot 2 \cdot \frac{1}{1}}$$

$$-\frac{14}{4} + \frac{1}{4}$$

$$-\frac{22}{1}$$

$$-\frac{13}{4}$$

$$-22 \div -\frac{13}{4}$$

$$-\frac{22 \cdot 4}{1} \cdot \frac{4}{-13}$$

$$-\frac{88}{-13} = \frac{88}{13} \text{ or } 6 \frac{10}{13}$$

**TODAY'S TAKE AWAY:** expressions

When evaluating numerical expressions, always follow the order of operations (PEMDAS).

**Let's Partner Up**



**Without evaluating the expressions**, determine which numerical expressions will result in a negative number. Select all that apply.

a)  $11.6 - 15.7$

$11.6 + (-15.7)$

b)  $\left(-\frac{2}{5}\right)^2 + 5\frac{1}{4}$

$\oplus + \oplus$

c)  $(3.5)(4) \div \left(-\frac{2}{3}\right)$

$\oplus \div \ominus$

d)  $(0.5)(-3.75) - 20$

$\ominus + (-20)$