

Unit 3: Rational Numbers

Name: _____

3.6: Order of Operations with Rational Numbers

1. Evaluate. Show ALL workings!!!

a) $4.5 + \boxed{5.1 \div 1.7}$

$$= 4.5 + 3$$

$$= 7.5$$

b) $-5.8 - \boxed{3.1 \times 0.5}$

$$= -5.8 - 1.55$$

$$= -7.35$$

2. Evaluate. Show ALL workings!!!

a) $\frac{2}{3} \times \left(-\frac{1}{2} \right) + \frac{5}{6}$

$$= -\frac{2}{6} + \frac{5}{6}$$

$$= \frac{3}{6}$$

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

b) $\frac{3}{8} - \frac{9}{4} \div \left[\left(-\frac{5}{4} \right) + \left(-\frac{1}{10} \right) \right]$

$$= \frac{3}{8} - \frac{9}{4} \div -\frac{27}{20}$$

$$= \frac{3}{8} \times \frac{9}{4} \times -\frac{20}{27}$$

$$= \frac{3}{8} \times -\frac{5}{8}$$

$$= \frac{9}{24} - \frac{40}{24}$$

$$= \frac{49}{24}$$

$$= 2 \frac{1}{24}$$

$$\textcircled{1} \quad \frac{-5x^5}{4x^5} - \frac{1x^2}{10x^2}$$

$$-\frac{25}{20} + -\frac{2}{20}$$

$$-\frac{27}{20}$$

$$\textcircled{2} \quad \frac{9}{4} \div -\frac{27}{20}$$

$$= \frac{9}{4} \times -\frac{20}{27}$$

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

3. A formula for the area of a trapezoid is $A = a \left(\frac{b+c}{2} \right)$ where b and c are the lengths of the parallel sides and a is the perpendicular distance between these sides. Use the formula to determine the area of a trapezoid with: $a = 3.5$ cm, $b = 5.7$ cm, $c = 8.1$ cm.

$$A = 3.5 \left(\frac{5.7 + 8.1}{2} \right)$$

$$= 3.5 \left(\frac{13.8}{2} \right)$$

$$= 3.5 (6.9)$$

$$= 24.15 \text{ cm}^2$$

4. Evaluate.

$$\begin{aligned}
 \text{a) } & -4\frac{2}{3} \div \left[\left(-\frac{1}{3} \right) + 4\frac{1}{6} \right] + \left(-3\frac{2}{5} \right) \\
 & = -\frac{14}{3} \div \left[\left(-\frac{1}{3} + \frac{25}{6} \right) \right] + \left(-\frac{17}{5} \right) \\
 & = \frac{-\frac{14}{3}}{\frac{23}{6}} + -\frac{17}{5} \\
 & = -\frac{28}{23} + -\frac{17}{5} \\
 & = -5\frac{31}{115} = -4\frac{71}{115} \\
 \text{① } & -\frac{1}{3} + \frac{25}{6} \\
 & = -\frac{2}{6} + \frac{25}{6} \\
 & = \frac{23}{6} \\
 \text{② } & -\frac{14}{3} \div \frac{23}{6} \\
 & = -\frac{14}{3} \times \frac{6}{23} \\
 & = -\frac{28}{23} \\
 \text{③ } & -\frac{28 \times 5}{23 \times 5} + -\frac{17 \times 23}{5 \times 23} = -\frac{140}{115} + -\frac{391}{115} = -\frac{531}{115}
 \end{aligned}$$

$$\begin{aligned}
 \text{b) } & 1\frac{5}{9} - \left(-2\frac{1}{6} \right) + \left[4\frac{1}{4} + \left(-3\frac{1}{2} \right) \right]^2 \div \frac{2}{5} \\
 & = \frac{14}{9} - \left(-\frac{13}{6} \right) + \left[\frac{7}{4} + \frac{-7}{2} \right]^2 \div \frac{2}{5} \\
 & = \frac{14}{9} - \left(-\frac{13}{6} \right) + \left(\frac{3}{4} \right)^2 \div \frac{2}{5} \\
 & = \frac{14}{9} - \left(-\frac{13}{6} \right) + \frac{9}{16} \div \frac{2}{5} \\
 & = \frac{14}{9} - \frac{13}{6} + \frac{45}{32} = \frac{2954}{576} = 5\frac{74}{576} = 5\frac{37}{288} \\
 \text{① } & \frac{17}{4} + \frac{-7 \times 2}{2 \times 2} = \frac{17}{4} + -\frac{14}{4} : \frac{3}{4} \\
 & = \frac{14}{4} - \frac{14}{4} : \frac{3}{4} \\
 \text{② } & \left(\frac{3}{4} \right)^2 = \frac{3}{4} \times \frac{3}{4} = \frac{9}{16} \\
 \text{③ } & \frac{9}{16} : \frac{2}{5} = \frac{9}{16} \times \frac{5}{2} = \frac{45}{32} = \frac{67}{18}
 \end{aligned}$$

5. Evaluate this expression. Round the answer to the nearest hundredth.

$$\begin{aligned}
 & \frac{9.6 \times 12.6 - 5.1 \div (-7.4) - 0.6}{(-2.9) \div 1.3 - (-6.5)} \\
 & = \frac{120.96 - [5.1 \div (-7.4)] - 0.6}{(-2.23) - (-6.5)} \\
 & = \frac{120.96 - (-0.69) - 0.6}{4.27} \\
 & = \frac{121.65 - 0.6}{4.27} \\
 & = \frac{121.05}{4.27} \\
 & = 28.35
 \end{aligned}$$