Honors 6.1-6.3 Quiz Review
SHOW ALL WORK FOR FULL CREDIT!!

1.) Simplify the ratio. Pay attention to units!
   a.) \(\frac{10 \text{ in.}}{2 \text{ ft}} \times 12 = \frac{10 \div 2}{24 \div 2} \times \frac{5}{12}\)
   \[\frac{10 \div 2}{24 \div 2} = \frac{5}{12}\]
   \[\frac{10}{24} = \frac{5}{12}\]
   \[\frac{24}{2} = 12\]
   \[\frac{10}{2} = 5\]

   b.) \(3 \text{ gallons} : 10 \text{ quarts}\)
   \[\frac{3}{10} \times \frac{12}{12} = \frac{36}{120}\]
   \[\frac{3}{10} = \frac{6}{20}\]
   \[\frac{12}{12} = 1\]
   \[\frac{36}{120} = \frac{6}{20}\]
   \[\frac{6}{20} = \frac{3}{10}\]

   c.) \(28 \text{ oz} : 2 \text{ lb}\)
   \[\frac{28}{2} \times \frac{1}{16} = \frac{28}{32}\]
   \[\frac{28}{2} = 14\]
   \[\frac{1}{16} = \frac{1}{16}\]
   \[\frac{28}{32} = \frac{7}{8}\]

2.) The perimeter of a rectangle is 56 inches. The ratio of the length to the width is 6 : 1.
   Find the length and the width.
   \[2(6x) + 2(3x) = 56\]
   \[14x = 56\]
   \[x = 4\]
   \[L: 24 \text{ in}\]
   \[W: 4 \text{ in}\]

3.) The area of a rectangle is 525 square centimeters. The ratio of the length to the width is 7 : 3.
   Find the length and the width.
   \[A = L \times W\]
   \[525 = 7x \times 3x\]
   \[\frac{525}{21} = \frac{21x^2}{21}\]
   \[\sqrt{525} = x^2\]
   \[x = 5\]
   \[L: 35 \text{ cm}\]
   \[W: 15 \text{ cm}\]

4.) The measures of the angles of a triangle are in the extended ratio given.
   Find the measures of the angles of the triangle.
   a.) 1:7:10
   \[x + 7x + 10x = 180\]
   \[18x = 180\]
   \[x = 10\]
   \[10^\circ, 70^\circ, 100^\circ\]
   b.) 5:6:7
   \[5x + 6x + 7x = 180\]
   \[18x = 180\]
   \[x = 10\]
   \[50^\circ, 60^\circ, 70^\circ\]

5.) Solve the proportion.
   a.) \(\frac{3}{x} = \frac{1}{x - 6}\)
   \[3(x - 6) = x\]
   \[3x - 18 = x\]
   \[-3x = -18\]
   \[x = 6\]
   \[X = 9\]

   b.) \(\frac{3}{m + 3} = \frac{2}{m + 1}\)
   \[3m + 3 = 2m + 10\]
   \[-2m - 2m - 3\]
   \[m = 7\]

   c.) \(\frac{2}{k - 1} = \frac{5}{3k - 4}\)
   \[6k - 8 = 5k - 5\]
   \[-5k + 5\]
   \[-5k + 8\]
   \[k = 3\]
1. The ratio of two side lengths for the triangle is given. Solve for the variable.
   a.) \(AC : AB \) is 3:4.
   \[
   \frac{\frac{3x}{3}}{\frac{4x}{12}} = x
   \]
   \(x = 9\)
   
   b.) \(AB : CB \) is 2 : 1.
   \[
   \frac{\frac{2x}{2}}{\frac{2x}{2}} = \frac{6}{2x} \Rightarrow x = 3
   \]
   
   c.) \(AC : BC \) is 7:4.
   \[
   \frac{\frac{21}{3}}{\frac{2x+4}{3x+4}} = \frac{84}{14x+28}
   \]
   \(x = 3\)

7. Use the diagram and the given information to find the unknown length.
   a.) Find \(BC\).
   \[
   \frac{x}{6} = \frac{4}{12} \Rightarrow x = 2
   \]
   
   b.) Find \(BC\).
   \[
   \frac{x}{12} = \frac{18}{33} \Rightarrow x = 6
   \]
   
   c.) Find \(BE\).
   \[
   \frac{16}{x} = \frac{9}{12} \Rightarrow x = 16
   \]
   
   d.) Find \(AC\).
   \[
   \frac{x}{10} = \frac{5}{6} \Rightarrow x = \frac{54}{3}
   \]

8. Kenny purchases a scale model of a train. The model states that the scale is 1 inch: 5.4 feet.
   a.) If the model is 10 inches long, how long is the actual train?
   \[
   \frac{1 \text{ in}}{5.4 \text{ ft}} \times 10 \text{ in} = \frac{54 \text{ ft}}{5.4} = 10 \text{ ft}
   \]
   
   b.) The actual height of the train is 13.5 feet, how tall is the model?
   \[
   \frac{1 \text{ in}}{5.4 \text{ ft}} \times 13.5 \text{ ft} = \frac{13.5 \times 5.4}{5.4} = 15 \text{ in}
   \]
10.) In November, 2005, the exchange rate of Mexican pesos to U.S. dollars was 10.77 to 1. While on vacation, you paid 205 pesos for a sombrero at a gift shop. What was the price of the sombrero in U.S. dollars?

\[
\begin{align*}
10.77 \text{ pesos} & \times \frac{205 \text{ pesos}}{x \text{ pesos}} \\
& \Rightarrow \frac{10.77 \times 205}{10.77} \\
& \approx 19.03
\end{align*}
\]

10. In November, 2005, the exchange rate of Canadian dollars to U.S. dollars was 1 to 0.85. A Canadian citizen paid $12.28 in U.S. dollars for lunch while visiting New York City. What was the price of the lunch in Canadian dollars?

\[
\begin{align*}
\frac{1}{.85} \times \frac{x \text{ C.}}{12.28} \\
\Rightarrow \frac{12.28 \times .85}{.85} \\
\Rightarrow x \approx 14.45
\end{align*}
\]

11.) In the diagram, \( \triangle XYZ \sim \triangle MNP \).

a.) Find the scale factor of \( \triangle XYZ \) to \( \triangle MNP \).

\[
\frac{XZ}{MN} = \frac{4}{5} = \frac{2\frac{2}{3}}{\frac{5}{3}}
\]

b.) Find the unknown side lengths of both triangles.

\[
\begin{align*}
\frac{XY}{XZ} & = \frac{XZ}{MZ} \\
\Rightarrow \frac{xy}{9} & = \frac{4\frac{1}{3}}{10} \\
\Rightarrow xy & = 36 \\
\Rightarrow xy & = 36 \\
\frac{PN}{YZ} & = \frac{MP}{XZ} \\
\Rightarrow 10x & = 36 \\
\Rightarrow x & = 3.6
\end{align*}
\]

c.) Find the length of the altitude shown in \( \triangle XYZ \).

\[
5.8 \times \frac{2.32}{5} = 2.32
\]

d.) Find and compare the areas of both triangles.

\[
\begin{align*}
\text{Area of } \triangle XYZ & = 6.23 \text{ units}^2 \\
\text{Area of } \triangle MNP & = 43.5 \text{ units}^2 \\
\triangle MNP \text{ is } 6 \text{ times bigger}
\end{align*}
\]
2.) Determine whether the polygons are similar. If they are, write a similarity statement and find the scale factor of Figure A to Figure B.

a.) \( \triangle LOP \sim \triangle NMR \)
\[
\frac{8}{6} = \frac{12}{9} = \frac{4.5}{3} = \frac{1\frac{1}{3}}{1} = \frac{\text{similar}}{\text{similar}}
\]

\( \triangle LOP \sim \triangle NMR \)
\[
SF = \frac{6}{8} = \frac{3}{4}
\]

b.) \( \triangle ABC \sim \triangle DEF \)
\[
\frac{8}{8} = \frac{12.8}{12.8}
\]
\( \frac{6.25}{6.25} \sim \text{similar} \)
\[
SF = \frac{12.8}{8} = 1.6
\]

13.) Find all possible values of \( x \).

a.) \( \triangle FGH \sim \triangle JKL \)
\[
3x + 2 \quad 5x \\
G \quad H
\]
\[
5x - 2 \quad 7x \\
K \quad L
\]
\[
\frac{3x + 2}{5x - 2} \quad \frac{7x(3x + 2)}{5x - 2}
\]
\[
21x^2 + 14x = 25x^2 - 10x \\
-24x^2 - 10x - 21x^2 - 14x = 0
\]
\[
4x^2 - 24x
\]
\[
x = 0
\]

b.) \( \triangle CDE \sim \triangle FGH \)
\[
7x \quad \frac{8x - 1}{9x} \\
\frac{10x + 1}{10x + 1}
\]
\[
70x^2 + 7x = 72x^2 - 9x \\
-70x^2 - 7x = -70x^2 - 7x \\
0 = 2x^2 - 16x \\
2x(x - 8) = 0
\]
\[
x = 0, x = 8
\]

14.) Factor and solve.

1) \( b^2 + 8b + 7 \)
\[
(b+1)(b+7) \\
b+1 = 0 \quad b+7 = 0
\]
\[
-1 \quad -7
\]

2) \( n^2 - 11n + 10 \)
\[
(n-10)(n-1) \\
n-10 = 0 \quad n-1 = 0
\]
\[
n=10 \quad n=1
\]

3) \( m^2 + m - 90 \)
\[
(m-9)(m+10) \\
m-9 = 0 \quad m+10 = 0
\]
\[
9 \quad -10
\]

4) \( n^2 + 4n - 12 \)
\[
(n-2)(n+6) \\
n-2 = 0 \quad n+6 = 0
\]
\[
2 \quad -6
\]