

Show all work in a neat and orderly fashion for partial credit.

Solve each of the following problems #1-5 for the unknown variable.

$$1.) \begin{array}{r} x - 30 = 4 + 2x \\ -2x + 30 + 30 - 2x \\ \hline -x = 34 \\ \frac{-x}{-1} = \frac{34}{-1} \Rightarrow \boxed{x = -34} \end{array}$$

$$2.) \begin{array}{r} 3t + 7.2 = -6.5 \\ -7.2 - 7.2 \\ \hline 3t = -13.7 \\ \frac{3t}{3} = \frac{-13.7}{3} \\ \boxed{t = -4.5\bar{6}} \end{array}$$

State your solution as a decimal.

$$\begin{array}{r} 4.566\bar{6} \\ 3 \overline{) 13.700} \\ \underline{-12} \\ 17 \\ \underline{-15} \\ 20 \\ \underline{18} \\ 20 \end{array}$$

$$3.) \begin{array}{r} s - \frac{1}{6} = \frac{-2}{5} \\ +\frac{1}{6} + \frac{1}{6} \\ \hline \end{array}$$

State your solution as a fraction.

$$s = \frac{-2}{5} + \frac{1}{6} = \frac{-2(6)}{5(6)} + \frac{1(5)}{6(5)} = \frac{-12 + 5}{30} = \frac{-7}{30}$$

$$\boxed{s = -\frac{7}{30}}$$

$$4.) \begin{array}{r} 3 + 6(w-2) = 6 - 5(w-6) \end{array}$$

State your solution as a fraction.

$$\begin{array}{r} 3 + 6w - 12 = 6 - 5w + 30 \\ 6w - 9 = -5w + 36 \\ +5w + 9 \\ \hline \end{array}$$

$$\frac{11w}{11} = \frac{45}{11}$$

$$\boxed{w = \frac{45}{11}}$$

$$5.) \begin{array}{r} 5y - 7 > 8y - (2y + 8) \end{array}$$

State your solution as an inequality.

$$\begin{array}{r} 5y - 7 > 8y - 2y - 8 \\ 5y - 7 > 6y - 8 \\ -6y + 7 \\ \hline \end{array}$$

$$\frac{-y}{-1} > \frac{-1}{-1}$$

$$\boxed{y < 1}$$

6.) Complete the table and use it to solve the given equation $3 - 2x = 3$.

x	-2	-1	0	1	2
$3 - 2x$	7	5	3	1	-1

The solution is $x = 0$.

$$3 - 2(-2) = 3 + 4 = 7$$

$$3 - 2(-1) = 3 + 2 = 5$$

$$3 - 2(0) = 3 + 0 = 3$$

$$3 - 2(1) = 3 - 2 = 1$$

$$3 - 2(2) = 3 - 4 = -1$$

7.) Convert 120% to a fraction.

$$120\% = \frac{120}{100} = \frac{\cancel{20}(6)}{\cancel{20}(5)} = \left(\frac{6}{5}\right)$$

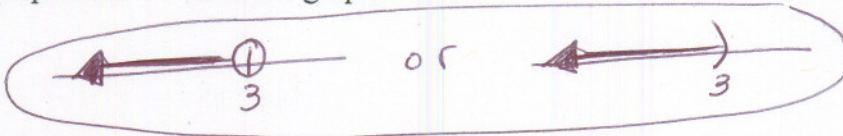
8.) Convert 120% to a decimal.

$$120\% = \frac{120}{100} = \overset{120}{\curvearrowright} = (1.20)$$

9.) Express $x < 3$ in interval notation.

$$(-\infty, 3)$$

10.) Express $x < 3$ as a line graph.



11.) Use the formula $C = \frac{5}{9}(F - 32)$ to convert 72.5 degrees Fahrenheit to Celsius.

Write your answer as a decimal.

$$C = \frac{5}{9}(72.5 - 32) = \frac{5}{9}(40.5) = 5(4.5) = \boxed{22.5^\circ\text{C}}$$

$$\begin{array}{r} 72.5 \\ -32.0 \\ \hline 40.5 \end{array}$$

$$\begin{array}{r} 4.5 \\ 9 \overline{) 40.5} \\ \underline{-36} \\ 4.5 \\ \underline{-4.5} \\ 0 \end{array}$$

$$\begin{array}{r} 24.5 \\ \times 5 \\ \hline 22.5 \end{array}$$

12.) In 1993, hydroelectric power production hit an all-time high of 309 billion kilowatt-hours. This is 13 billion kilowatts-hours more than four times the 1952 production level. **Set up** an equation using x to represent the 1952 production level in billions of kilowatt-hours. **Do not solve.**

$$\boxed{309 = 4x + 13}$$

$$\frac{296}{4} = \frac{4x}{4}$$

$$74 = x \Rightarrow 74 \text{ billion Kilowatt-hour in 1952}$$

13.) Frances left a 15% tip on a meal. Including tip, its cost was \$57.50. **Set up** an equation using x to represent the cost of the meal before the tip was added. **Do not solve.**

$$\boxed{x + .15x = 57.50}$$

$$\frac{1.15x}{1.15} = \frac{57.50}{1.15}$$

$$x = 50 \text{ for cost of meal}$$

14.) The sum of the measures of the angles of any triangle is 180 degrees. Suppose one angle is 20 degrees larger than the smallest angle and the remaining angle is six times the measure of the smallest angle. **Set up** an equation using x to represent the smallest angle. **Do not solve.**

$$\boxed{(x) + (x+20) + (6x) = 180}$$

$$\frac{8x + 20}{-20} = \frac{180}{-20}$$

$$\frac{8x}{8} = \frac{160}{8} \Rightarrow$$

$$\begin{aligned} x &= 20 \\ x+20 &= 40 \\ 6(20) &= 120 \end{aligned}$$

angles are 20°
 40°
 120°

15.) State the formula for finding the area of a circle.

$$\boxed{A = \pi r^2}$$

16.) State the formula for finding the area of a rectangle.

$$\boxed{A = lw}$$

17.) State the formula for finding the perimeter of a rectangle.

$$\boxed{P = 2l + 2w}$$

18.) If the perimeter of a rectangle is equal to 44 feet and the width is 8 feet, find the length of the rectangle.

$$\begin{aligned} P &= 44 \text{ feet} = 2l + 2w \\ w &= 8 \text{ feet} \end{aligned}$$

$$44 = 2l + 2(8)$$

$$\begin{aligned} 44 &= 2l + 16 \\ -16 & \quad -16 \end{aligned}$$

$$\frac{28}{2} = \frac{2l}{2} \Rightarrow \boxed{l = 14 \text{ feet}}$$