Solve for $y$.

\[ w(y+z) = x+6 \]

\[ wy + wz = x+6 \]

\[ wy = x+6-wz \]

\[ y = x+6-wz \]

**Distribution**

\[ \frac{y}{w} \]

Solve for $x_2$.

\[ \text{lcd: } x_1 \times x_2 \]

\[ x_2 \left( \frac{8}{1} = \frac{y}{x_1} + \frac{y}{x_2} \right) x_1 x_2 \]

\[ 8x_1 x_2 = \frac{y \cdot x_1 \cdot x_2}{x_1} + \frac{y \cdot x_1 \cdot x_2}{x_2} \]

\[ 8x_1 x_2 = yx_2 + yx_1 - yx_1 - yx_2 \]

\[ 8x_1 x_2 - yx_2 = yx_1 \]

factor out

\[ x_2 \left( 8x_1 - y \right) = \frac{yx_1}{8x_1 - y} \]

\[ x_2 = \frac{yx_1}{8x_1 - y} \]
Let \( n \) be the middle number of three consecutive integers. Write an expression for the sum of these integers.

\[
\text{n is middle} \\
\text{n-1 previous} \\
\text{n+1 next} \\
\text{n - 1} + n + n + 1 = 3n
\]

Lucy works as a tutor for $11 an hour and as a waitress for $8 an hour. This month, she worked a combined total of 105 hours at her two jobs.

Let \( t \) be the number of hours Lucy worked as a tutor this month. Write an expression for the combined total dollar amount she earned this month.

\[
\frac{11}{\text{hr}} \cdot t \text{ hr} = 11t \text{ dollars} \\
\frac{8}{\text{hr}} (105-t) \text{ hr} = 8(105-t) \text{ dollars} \\
11t + 8(105-t) = 11t + 840 - 8t = 3t + 840 \]
David's Coffee Shop makes a blend that is a mixture of two types of coffee. Type A coffee costs David $4.70 per pound, and type B coffee costs $5.85 per pound. This month's blend used three times as many pounds of type B coffee as type A, for a total cost of $623.00. How many pounds of type A coffee were used?

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>$4.70</td>
<td>x lb</td>
<td>$</td>
</tr>
<tr>
<td>B</td>
<td>$5.85</td>
<td>3x lb</td>
<td>$</td>
</tr>
</tbody>
</table>

\[
x = 155.75
\]
The length of a rectangle is 3 yd longer than its width. If the perimeter of the rectangle is 46 yd, find its area.

\[ l = w + 3 \]
\[ w + 3 = 13 \]

\[ 4w + 6 = 46 \]
\[ 4w = 40 \]
\[ w = 10 \]

Area: \[ A = l \cdot w \]
\[ A = 13 \cdot 10 \]
\[ A = 130 \]
The wholesale price for a pair of shoes is $3.50. A certain department store marks up the wholesale price by 50%. Find the price of the pair of shoes in the department store.

Round your answer to the nearest cent, as necessary.

\[3.50 + .5 \times 3.50\]

\[3.50 + 1.75 = 5.25\]

A laptop has a listed price of $519.99 before tax. If the sales tax rate is 7.75%, find the total cost of the laptop with sales tax included.

Round your answer to the nearest cent, as necessary.

\[519.99 \times 1.0775 = 560.289\ldots\]
An alloy is a mixture of metals. Suppose that a certain alloy is made by mixing 28 grams of an alloy containing 15% copper with 100 grams of an alloy containing 55% copper.

Answer the questions below. Do not do any rounding.

<table>
<thead>
<tr>
<th>(a) How many grams of copper are in the resulting mixture?</th>
<th>grams</th>
<th>59.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>(b) What percentage of the resulting mixture is copper?</td>
<td>%</td>
<td>46.2</td>
</tr>
</tbody>
</table>

\[
\begin{align*}
\frac{15\text{cu}}{100\text{g}} & \times 28 \text{ g} = 4.2\text{cu} \\
\frac{55\text{cu}}{100\text{g}} & \times 100 \text{ g} = 55 \text{ cu} \\
\end{align*}
\]

\[
\begin{align*}
\frac{128\text{g}}{\text{128 g}} & = \frac{59.2 \text{ cu}}{59.2 \text{ cu}} \times 0.462
\end{align*}
\]
Solving a percent mixture problem using a linear equation

Donna invested her savings in two investment funds. The $6000 that she invested in Fund A returned a 2% profit. The amount that she invested in Fund B returned a 6% profit. How much did she invest in Fund B, if both funds together returned a 5% profit?

Let $x$ represent the amount (in dollars) invested in Fund B.
The amount invested in Fund A was $6000$ dollars.
Fund A had a 2% profit and Fund B had a 6% profit.
The total amount invested was $(x + 6000)$ dollars, with an overall profit of 5%.

<table>
<thead>
<tr>
<th></th>
<th>Amount invested</th>
<th>Profit percent</th>
<th>Profit amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fund A</td>
<td>6000</td>
<td>2%</td>
<td>$120$</td>
</tr>
<tr>
<td>Fund B</td>
<td>$x$</td>
<td>6%</td>
<td>$0.06x$</td>
</tr>
<tr>
<td>Total</td>
<td>6000 + $x$</td>
<td>5%</td>
<td>$300 + 0.05x$</td>
</tr>
</tbody>
</table>

$120 + 0.06x = 300 + 0.05x$
Inequalities \[ x + 2 > 7 \]
\[ x > 5 \]

ex: \[-x > 7\]  
\[ \frac{-x}{-1} < \frac{7}{-1} \]

DONT DIVIDE BY NEGATIVE WITHOUT SWITCHING INEQUALITY
1. Write the following as an inequality.
   0 is less than or equal to x and
   6 is greater than or equal to x
   Use x only once in your inequality.

\[ 0 \leq x \leq 6 \]
Graph the compound inequality on the number line.

\[ x \leq 0 \text{ or } x > 5 \]
Write a compound inequality for the graph shown below. Use $x$ for your variable.

$x \geq 0$ and $x < 4$

$4 \geq x \geq 0$
4. Graph the set \( \{ x \mid -2 \leq x < 0 \} \) on the number line.

Then, write the set using interval notation.
5. The sets $F$ and $H$ are defined as follows.

$$F = \{ x \mid x > 1 \}$$

$$H = \{ x \mid x \leq 6 \}$$

Write $F \cup H$ and $F \cap H$ using interval notation. If the set is empty, write $\emptyset$.

\[
\begin{align*}
F &= (1, \infty) \\
H &= (-\infty, 6] \\
F \cup H &= (-\infty, \infty) \\
F \cap H &= [1, 6]
\end{align*}
\]
6. For each value of \( v \) determine whether it is a solution to \(-6 + 5v < -26\):

\[-6 + 5(-5) < -26\]
\[-31 < -26\]

<table>
<thead>
<tr>
<th>( v )</th>
<th>Is it a solution?</th>
</tr>
</thead>
<tbody>
<tr>
<td>-4</td>
<td>Yes</td>
</tr>
<tr>
<td>9</td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>No</td>
</tr>
<tr>
<td>-5</td>
<td>Yes</td>
</tr>
</tbody>
</table>

\[-6 + 5v \leq -20\]
\[-5v \leq -20 + 6\]
\[-\frac{20}{5} \leq -4\]
\[v \leq -4\]
7. Solve the inequality for $z$

$$20 > z + 2$$

Simplify your answer as much as possible.

Solve for $z$

$$20 > z + 2$$

$$-a - a$$

$$18 > 2$$
8. Solve the inequality for $u$

$-5 + u > -9$

Simplify your answer as much as possible.
9. Solve the inequality for $y$

$$y + \frac{5}{8} \geq -\frac{1}{4}$$

Simplify your answer as much as possible.

$$y \geq -\frac{7}{8}$$
20. Solve the compound inequality.

\[-12 \leq 4x + 4 < 16\]

\[-4 \quad -4 \quad -4\]

\[-16 \leq 4x < 12\]

\[-\frac{16}{4} \quad \frac{4}{4} \quad \frac{12}{4}\]

\[-4 \leq x < 3\]
\[ \exists x \quad |x| = 3 \]

\[ 3, -3 \]

\[ \exists x \quad |x| > 3 \]

\[ x > 3 \quad \text{or} \quad -x > 3 \]

great OR

\[ \exists x \quad |x + 1| < 5 \]

\[ x + 1 < 5 \quad \text{and} \quad -(x+1) < 5 \]

less th 'and'