Aim: I can write an equation to find an unknown angle and solve by writing out each step.

Do Now

Two lines meet at a point. In a complete sentence, describe the relevant angle relationships in the diagram. Find the values of $r$, $s$, and $t$. Use notes from yesterday’s lesson or videos to help!

Model Example 1

Two lines meet at a point that is also the endpoint of a ray. In a complete sentence, describe the relevant angle relationships in the diagram. Set up and solve an equation to find the value of $p$ and $r$. 
Model Example 2

Three lines meet at a point. In a complete sentence, describe the relevant angle relationships in the diagram. Set up and solve an equation to find the value of $z$. 

\[
\begin{align*}
28 + 160 + p &= 180 \\
44 + p &= 180 \\
-44 &= -44 \\
\frac{136}{4} &= \frac{p}{4} \\
4p &= 136^\circ \\
\text{So since } 4p + 4r \text{ fall on a line I know that they are equal to } 180^\circ: \\
180 &= 4r \\
180 - 136 &= 4r \\
44 &= 4r \\
44 &= 4r \\
4 &= 4r \\
\frac{44}{4} &= \frac{4r}{4} \\
11 &= r
\end{align*}
\]
Since $\angle 2$, the right $\angle$ and the $\angle$ that measures $19^\circ$ all fall on a line, I know that all 3 $\angle$s will be equal to $180^\circ$.

\[90 + 19 + z = 180\]
\[109 + z = 180\]
\[-109\]
\[-109\]
\[-z = 71] \text{ (then)}

Since the right $\angle$ and $\angle 2$ are on a line, I know that they will equal $180^\circ$.

\[71 + 90 + y = 180\] \(\Rightarrow\) \[50 + y = 19\]
\[161 + y = 180\] \(\Rightarrow\) \[161 = 19\]
\[-161\]
\[-161\]
You try # 1

Two lines meet at a point that is also the endpoint of a ray. The ray is perpendicular to one of the lines as shown. In a complete sentence, describe the relevant angle relationships in the diagram. Set up and solve an equation to find the value of $t$. 
You try #2

Three lines meet at a point. In a complete sentence, describe the relevant angle relationships in the diagram. Set up and solve an equation to find the value of $x$. Is your answer reasonable? Explain how you know.

REMINDER:
- To solve an unknown angle problem, identify the angle relationship(s) first to set up an equation that will yield the unknown value.
- Angles on a line and supplementary angles are not the same relationship. Supplementary angles are two angles whose angle measures sum to 180° whereas angles on a line are two or more adjacent angles whose angle measures sum to 180°.