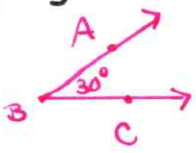
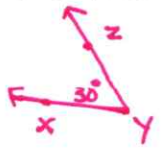
# 12.1 Adjacent and Vertical Angles p.504

**Congruent angles:** angles that have the same measure (degrees)

donut vs. bagel

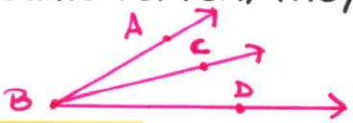



$\angle ABC \cong \angle XYZ$

$\cong$ is the symbol for congruent

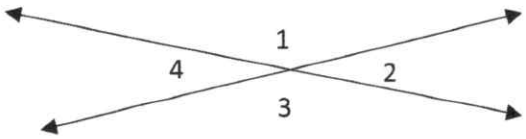
**Adjacent angles:** angles that have a common side and the same vertex; they are **next** to each other




$\angle abc$ is adjacent to $\angle cbd$

B is the vertex $\overrightarrow{BC}$ is the common side

**Vertical angles:** angles that are opposite each other **(across)** (diagonal) from intersecting lines; they are **congruent**




adjacent

$\angle 1$ and $\angle 2$

$\angle 4$ and $\angle 3$

$\angle 2$ and $\angle 3$

$\angle 1$ and $\angle 4$

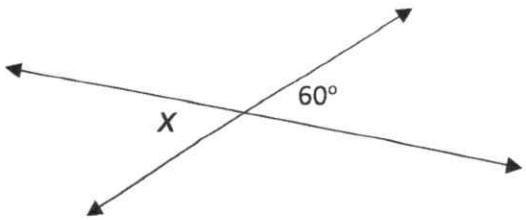
vertical

$\angle 1$ and $\angle 3$

$\angle 2$ and $\angle 4$

Tell whether the angles are adjacent or vertical; then find the value of the variable.

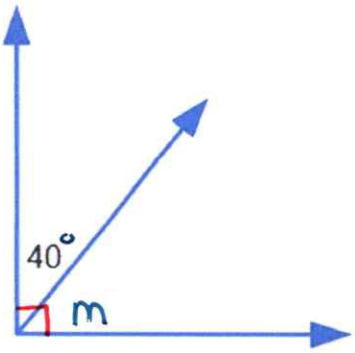
1.




vertial

60°

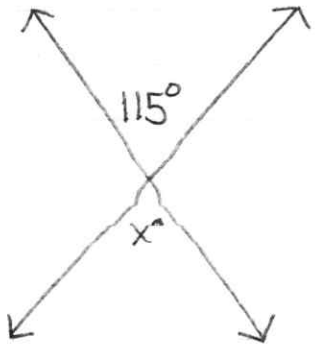
2.



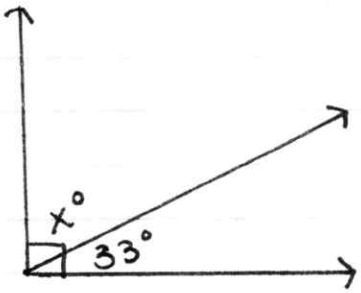

adjacent

50°

(together they are 90°)

3) 

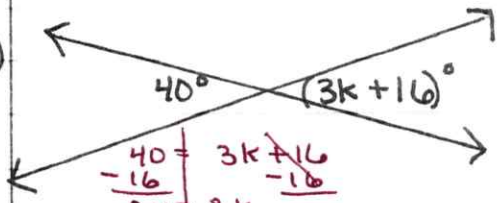

vertical
115°

4) 


adjacent
57°

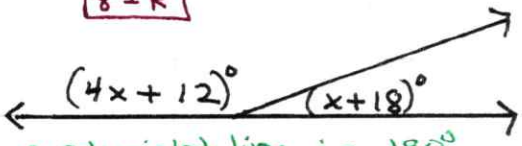
$90 - 33 = 57$

* we learned how to solve equations in chapter 3

5) 


vertical
$k = 8$

$40 = 3k + 16$
$-16 \quad -16$
$\frac{24}{3} = \frac{3k}{3}$
$8 = k$

6) 


a straight line is 180° so add the angles and make them equal to 180°

adjacent
$x = 30$

$4x + 12 + x + 18 = 180$
$5x + 30 = 180$
$-30 \quad -30$
$\frac{5x}{5} = \frac{150}{5}$
$x = 30$

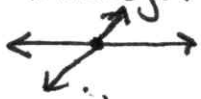
7) Construct vertical angles of 85°.

**steps**

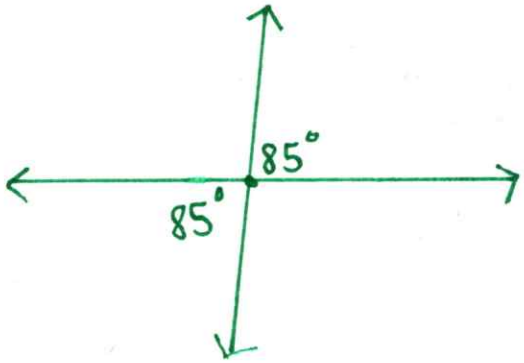
① draw a line w/ a vertex

② use that line to measure an 85° angle

③ Then contine the line all the way through the vertex



④ The angles opposite each other are vertical and congruent (≅)




⑤ label both