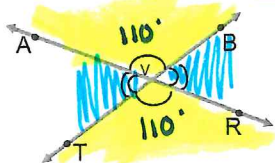


Angle Relationships: Notes Justifications

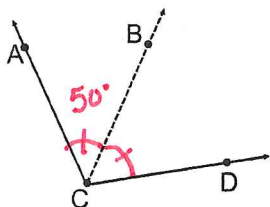
Justification: Vertical angles are congruent!



1. Name the vertical angles which are congruent.

$$\angle AVB \cong \angle RVT \quad \text{vertical } \angle \text{s are} \\ \angle BVR \cong \angle TVA \quad \cong$$

2. What is an angle bisector? Cuts an angle into 2 \cong parts



If \overrightarrow{CB} is an angle bisector, state what is true about the figure.

Justification: Definition of Angle Bisector

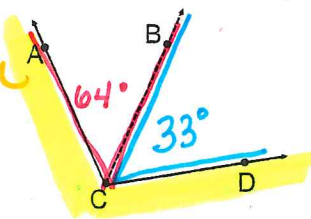
$$\angle ACB \cong \angle DCB \quad \text{def of } \angle \\ 50^\circ = \angle DCB \quad \text{bisector}$$

3. Use the same figure, but DO NOT assume Ray CB is an angle bisector: If $m\angle ACB = 64^\circ$ and $m\angle BCD = 33^\circ$ find the $m\angle ACD$.

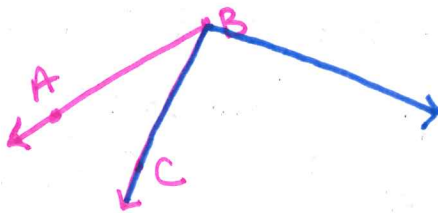
Justification: Angle Addition

$$\angle ACB + \angle BCD = \angle ACD \quad \text{angle addition} \\ 64^\circ + 33^\circ = \angle ACD$$

$$\boxed{97^\circ = \angle ACD}$$



4. Adjacent angles are angles which share a common vertex and a common side, we commonly say angles next to each other. Draw an adjacent angle to $\angle ABC$, which shares vertex B and side \overrightarrow{BC} .



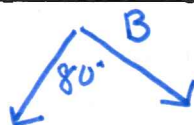
5. Straight Angle measures 180° . Draw an example of straight angle $\angle NJB$.

Justification: Definition of straight angle.



$$\angle NJB = 180^\circ \\ \text{def of} \\ \text{Straight } \angle$$

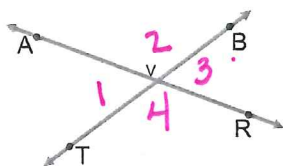
6. **Justification:** Definition of Supplementary



$$\angle A + \angle B = 180^\circ \\ \text{def of} \\ \text{Suppl.}$$

7. Linear Pairs

Justification: Linear Pairs are Supplementary



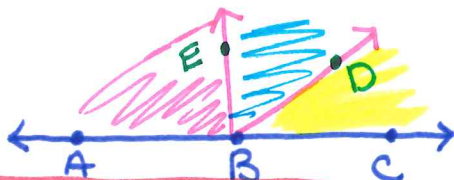
$$\angle 1 + \angle 2 = 180^\circ \quad \text{linear pairs are suppl.}$$

$$\angle 2 + \angle 3 = 180^\circ$$

$$\angle 3 + \angle 4 = 180^\circ$$

$$\angle 4 + \angle 1 = 180^\circ$$

8. Justification: Angle Addition (Straight angle)

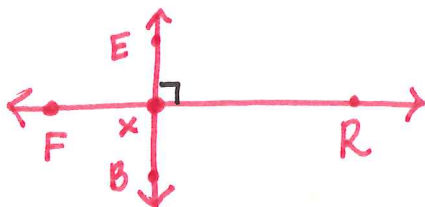


$$\angle ABE + \angle EBD + \angle DBC = 180^\circ$$

angle addition (straight \angle)

9. Draw $\overrightarrow{FR} \perp \overrightarrow{EB}$ which intersect at X.

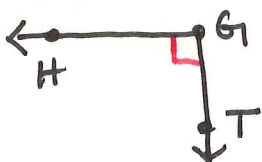
Justification: Definition of Perpendicular



$$\angle EXR = 90^\circ \quad \text{def of Perpendicular}$$

10. Draw $\angle HGT$ as a right angle.

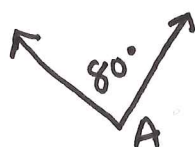
Justification: Definition of Right Angle



$$\angle HGT = 90^\circ \quad \text{def of Right } \angle$$

11. Draw $\angle HGT$ as a right angle.

Justification: Definition of complementary



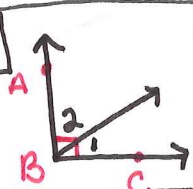
$$\angle A + \angle B = 90^\circ \quad \text{def of compl.}$$

12. Using Justifications:

Given: \overrightarrow{CB} is an angle bisector

Prove or Show: $2\angle ACB = \angle ACD$ and $\angle ACB = \frac{1}{2}\angle ACD$

Note



$$\angle ABC = 90^\circ$$

def of Right \angle

$$\angle 1 + \angle 2 = \angle ABC$$

angle addition

$$\angle 1 + \angle 2 = 90^\circ \quad \text{substitution}$$

1. \overrightarrow{CB} is angle bisector

$$2. \angle ACB \cong \angle BCD$$

$$3. \angle ACB + \angle BCD = \angle ACD$$

$$4. \angle ACB + \angle ACB = \angle ACD$$

$$5. 2\angle ACB = \angle ACD$$

$$6. \angle ACB = \frac{1}{2}\angle ACD$$

1. given

2. def of \angle bisector

3. angle addition

4. substitution

5. C LT

6. division