

Complete the flowchart proof.

Given $\angle 3$ and $\angle 2$ are complementary

$$m\angle 1 + m\angle 2 = 90^\circ$$

Prove $\angle 3 \cong \angle 1$

$$\therefore \angle 3 \cong \angle 1$$
$$\therefore m\angle 1 + m\angle 2 = 90^\circ$$

∴ $\angle 3$ and $\angle 2$ are complementary

∴ $\angle 1$ and $\angle 2$ are complementary

∴ Given

⌘ Congruent Complements Theorem

Definition of complementary angles

$$1 \quad \therefore m\angle 1 + m\angle 2 = 90^\circ$$
$$10 = 10$$

2 Given

3 $\therefore \angle 1$ and $\angle 2$ are complementary

4 :: Definition of complementary angles

5 $\therefore \angle 3 \cong \angle 1$

6 :: Congruent Complements Theorem

7 $\therefore \angle 3$ and $\angle 2$ are complementary

8 :: Given

Vertical angles

$$\begin{aligned}\angle 2 &\hat{=} \angle 3 \\ \angle 6 &\hat{=} \angle 7 \\ \angle 5 &\hat{=} \angle 8 \\ \angle 1 &\hat{=} \angle 4\end{aligned}$$

Supplementary $\angle$'s linear pair

$$\begin{array}{ll}\angle 1 \hat{=} \angle 2 & \angle 1 \hat{=} \angle 3 \\ \angle 3 \hat{=} \angle 4 & \angle 2 \hat{=} \angle 4 \\ \angle 5 \hat{=} \angle 6 & \angle 5 \hat{=} \angle 7 \\ \angle 7 \hat{=} \angle 8 & \angle 6 \hat{=} \angle 8\end{array}$$

transversal

$$\begin{aligned}\angle 1 &\hat{=} \angle 8 = \text{alternate} \\ \angle 2 &\hat{=} \angle 7 = \text{exterior} \\ &\text{angles}\end{aligned}$$

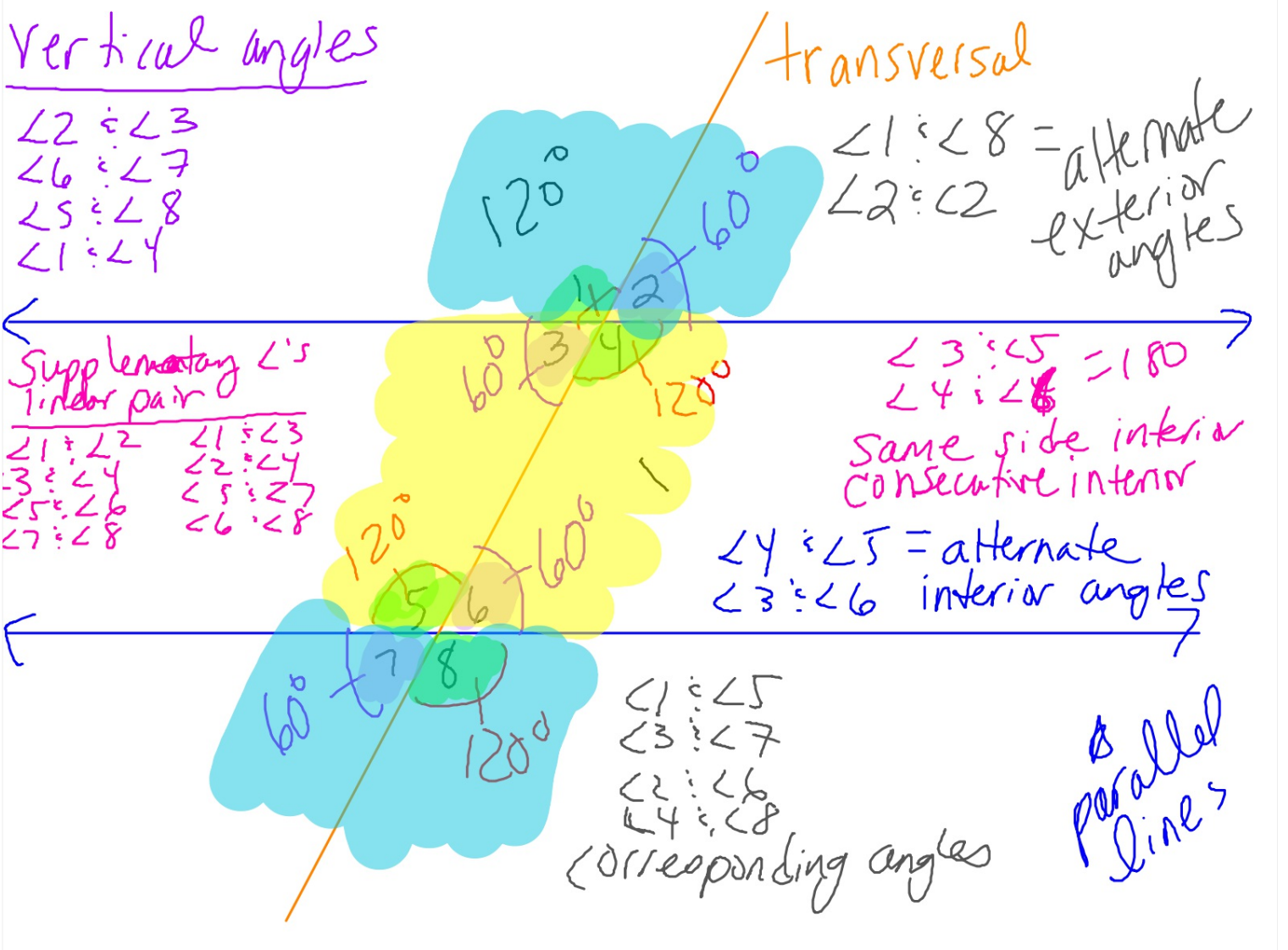
$$\begin{aligned}\angle 3 &\hat{=} \angle 5 = 180^\circ \\ \angle 4 &\hat{=} \angle 6 = 180^\circ\end{aligned}$$

same side interior
consecutive interior

$$\begin{aligned}\angle 4 &\hat{=} \angle 5 = \text{alternate} \\ \angle 3 &\hat{=} \angle 6 = \text{interior angles}\end{aligned}$$

$$\begin{aligned}\angle 1 &\hat{=} \angle 5 \\ \angle 3 &\hat{=} \angle 7 \\ \angle 2 &\hat{=} \angle 6 \\ \angle 4 &\hat{=} \angle 8 \\ \text{corresponding angles}\end{aligned}$$

$\parallel$
parallel
lines



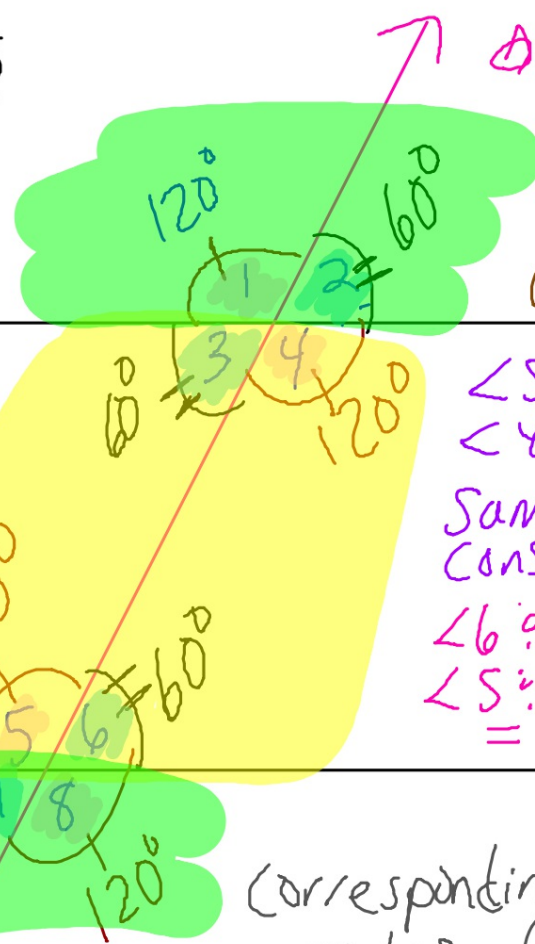
Vertical angles

$$\begin{aligned} \angle 1 &\hat{=} \angle 4 \\ \angle 2 &\hat{=} \angle 3 \\ \angle 5 &\hat{=} \angle 8 \\ \angle 6 &\hat{=} \angle 7 \end{aligned}$$

Supplementary = 180
linear pair

$$\begin{aligned} \angle 1 &\hat{=} \angle 2 & \angle 5 &\hat{=} \angle 7 \\ \angle 8 &\hat{=} \angle 7 & \angle 6 &\hat{=} \angle 8 \\ \angle 5 &\hat{=} \angle 6 \\ \angle 3 &\hat{=} \angle 4 \\ \angle 2 &\hat{=} \angle 4 \\ \angle 1 &\hat{=} \angle 3 \end{aligned}$$

$$\begin{aligned} \angle 1 &\hat{=} \angle 5 \\ \angle 3 &\hat{=} \angle 7 \end{aligned}$$



transversal

$$\angle 1 \hat{=} \angle 8 =$$

$$\angle 2 \hat{=} \angle 7$$

alternate exterior angle

$$\angle 5 \hat{=} \angle 3$$

Supplementary = 180

$$\angle 4 \hat{=} \angle 6$$

Same side interior
consecutive interior $\angle$'s

$$\angle 6 \hat{=} \angle 3$$

Alternate interior $\angle$'s

$$\angle 5 \hat{=} \angle 4$$

interior $\angle$'s

corresponding angles =

$$\begin{aligned} \angle 2 &\hat{=} \angle 6 \\ \angle 4 &\hat{=} \angle 8 \end{aligned}$$

parallel lines

Vertical angles

$\angle 2 \angle 3$
 $\angle 1 \angle 4$ always
 $\angle 6 \angle 7$
 $\angle 5 \angle 8$

linear pair = 180
(supplementary)

$\angle 1 \angle 2$ $\angle 2 \angle 4$
 $\angle 3 \angle 4$ $\angle 1 \angle 3$
 $\angle 5 \angle 6$ $\angle 5 \angle 7$
 $\angle 7 \angle 8$ $\angle 6 \angle 8$

transversal

Alternate Exterior angles

$\angle 1 \angle 8 = \text{congruent}$
 $\angle 2 \angle 7 = \text{congruent}$

Same side interior
consecutive interior

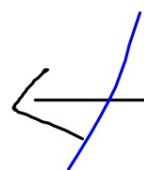
$\angle 4 \angle 6 = 180$
 $\angle 3 \angle 5$ supplementary

Alternate Interior Angles

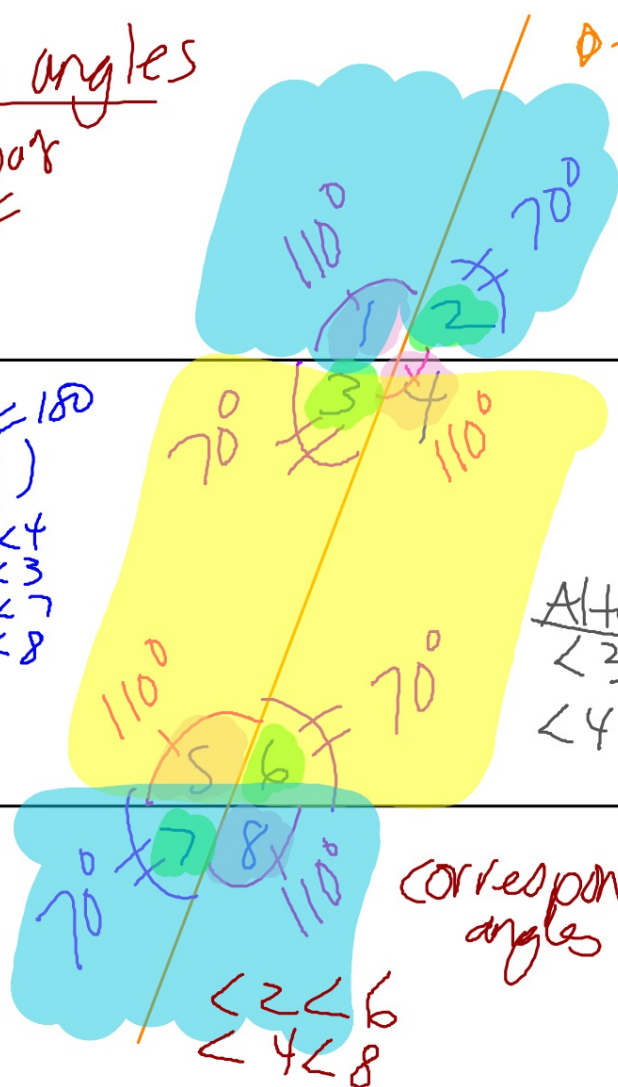
$\angle 3 \angle 6$ congruent
 $\angle 4 \angle 5$ congruent

corresponding angles

parallel lines



$\angle 3 \angle 7$
 $\angle 1 \angle 5$



$\angle 2 \angle 6$
 $\angle 4 \angle 8$

Vertical angles

$$\begin{array}{ll} \angle 1 \angle 4 & \angle 6 \angle 7 \\ \angle 2 \angle 3 & \angle 5 \angle 8 \end{array}$$

Congruent

linear pair = 180
Supplementary

$$\begin{array}{ll} \angle 5 \angle 6 & \angle 6 \angle 8 \\ \angle 1 \angle 2 & \angle 5 \angle 7 \\ \angle 7 \angle 8 & \angle 1 \angle 3 \\ \angle 3 \angle 4 & \angle 2 \angle 4 \end{array}$$

$$\angle 7 \angle 2$$

$$\angle 8 \angle 1 =$$

Alternate Exterior angles

transversal

$$\begin{array}{l} \angle 2 \angle 6 \text{ Corresponding} \\ \angle 4 \angle 8 \text{ Corresponding} \\ \angle 1 \angle 5 \text{ Corresponding} \\ \angle 3 \angle 7 \end{array}$$

Same Side Interior
Consecutive interior

$$\begin{array}{l} \angle 5 \angle 3 \text{ Supplementary} \\ \angle 4 \angle 6 \text{ } 180^\circ \end{array}$$

Alternate Interior angles

parallel lines



Vertical angles

$\angle 1 \angle 4$
 $\angle 2 \angle 3$
 $\angle 5 \angle 8$
 $\angle 6 \angle 7$

linear pairs = 180
supplementary

$\angle 1 < \angle 2$	$\angle 1 < \angle 3$
$\angle 3 < \angle 4$	$\angle 2 < \angle 4$
$\angle 5 < \angle 6$	$\angle 5 < \angle 7$
$\angle 7 < \angle 8$	$\angle 6 < \angle 8$

transversal

- transversal

$\angle 7 \cong \angle 2$ Alternate
 $\angle 1 \cong \angle 8$ Exterior
congruent angles

consecutive interior
same side interior

$\angle 5 \angle 3$ Supplensi
 $\angle 4 \angle 6$

Alternate Interior Angles
 $\angle 4 \angle 5$
 $\angle 3 \angle 6$ congruent

$\angle 3 \angle 7$ corresponding
 $\angle 1 \angle 5$ angles

$\angle 2 \angle 6$
 $\angle 4 \angle 8$
 Congruent

parallel lines