

Tools For Geometry – Angle Pairs

Notes Section 1.5

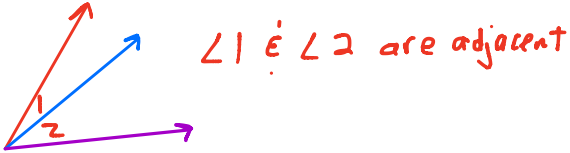
Name _____

Postulate – A statement that assumed to be true.

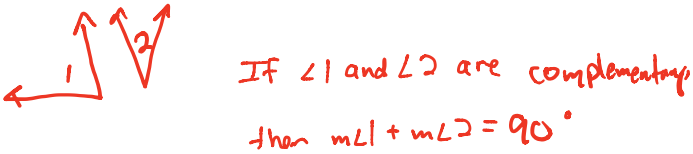
Theorem – A statement that can be proved true using established facts.

PAIRS OF ANGLES

Adjacent Angles – two angles that have the same vertex, share common ray, and have no common interior points.



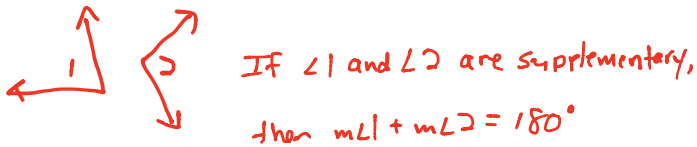
Complementary Angles – two angles that sum to 90° . Each angle is called the complement.



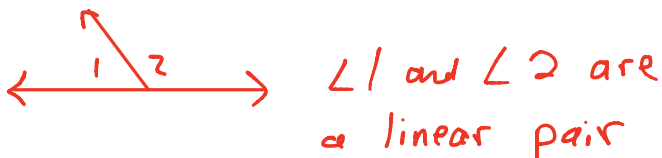
Complement Theorem – If the noncommon sides of two adjacent angles form a right angle, then the angles are complementary.



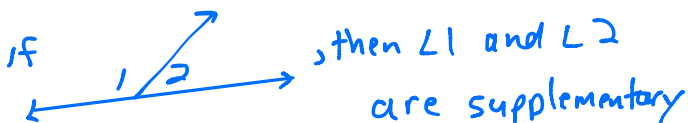
Supplementary Angles – two angles that sum to 180° . Each angle is called the supplement.



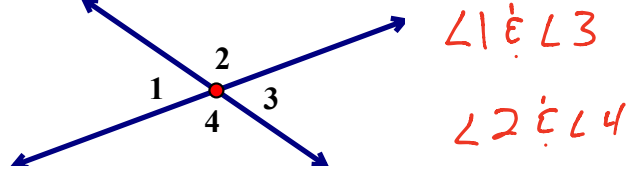
Linear Pair – two adjacent angles whose non-common sides form opposite rays (form a straight angle).



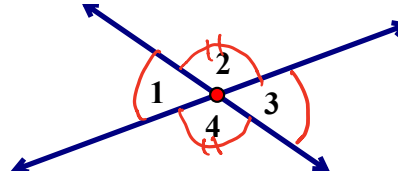
Supplement Theorem – If two angles form a linear pair, then they are supplementary.



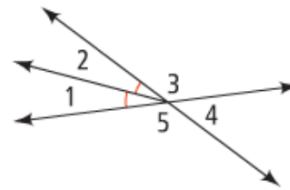
Vertical Angles - two nonadjacent angles formed by intersecting lines.



Vertical Angles Theorem: Vertical angles are congruent.



Identify Angle Pairs



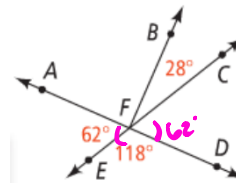
ANGLES

Adjacent: $\angle 1 \angle 2$, $\angle 2 \angle 3$, $\angle 3 \angle 4$

Vertical: $\angle 3 \angle 5$

Complementary: None

Supplementary: $\angle 3 \angle 4$, $\angle 4 \angle 5$



$\angle AFE$ and $\angle EFD$ are Supplementary (Linear pair)

$\angle AFE$ and $\angle BFC$ are Complementary

$\angle BFC$ and $\angle CFD$ are Complementary

$\angle AFE$ and $\angle CFD$ are vertical (congruent)

Tools For Geometry – Angle Pairs

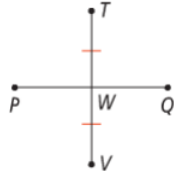
Notes Section 1.5

Name _____

Diagrams

OK to assume true!

$$TW = WV$$

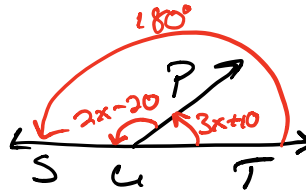


Do NOT assume

$$\overline{TV} \perp \overline{PQ}$$

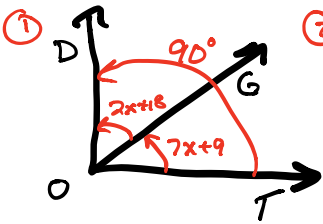
$$PW = WQ$$

3. $\angle SUP$ and $\angle PUT$ form a linear pair. If $m\angle SUP = 2x - 20$, and $m\angle PUT = 3x + 10$, then find the value of x .



$$\begin{aligned} m\angle SUP + m\angle PUT &= m\angle SUT \\ (2x - 20) + (3x + 10) &= 180 \\ 5x - 10 &= 180 \\ 5x &= 190 \\ x &= 38 \end{aligned}$$

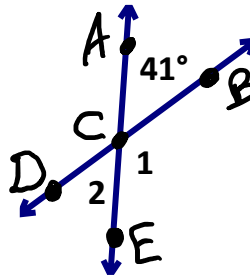
1. $\angle DOG$ and $\angle GOT$ are complementary angles. If $m\angle DOG = 2x + 18$ and $m\angle GOT = 7x + 9$, then find $m\angle DOG$.



$$\begin{aligned} m\angle DOG + m\angle GOT &= 90^\circ \\ (2x + 18) + (7x + 9) &= 90^\circ \\ 9x + 27 &= 90^\circ \\ 9x &= 63 \\ x &= 7 \end{aligned}$$

$$\begin{aligned} m\angle DOG &= 2x + 18 \\ &= 2(7) + 18 \\ &= 14 + 18 \\ m\angle DOG &= 32 \end{aligned}$$

4. Find $m\angle 1$ & $m\angle 2$



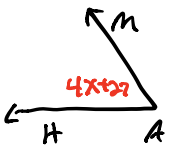
(Vertical angles)

$$\begin{aligned} m\angle DCE &= m\angle ACB \\ m\angle 2 &= 41^\circ \end{aligned}$$

Supplement Theorem

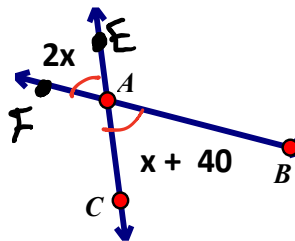
$$\begin{aligned} m\angle ACB + m\angle 1 &= 180 \\ 41^\circ + m\angle 1 &= 180 \\ m\angle 1 &= 139^\circ \end{aligned}$$

2. $\angle HAM$ and $\angle CES$ are supplementary. If $m\angle HAM = 4x + 27$ and $m\angle CES = 14x + 9$, then find the value of x .



$$\begin{aligned} m\angle HAM + m\angle CES &= 180^\circ \\ (4x + 27) + (14x + 9) &= 180^\circ \\ 18x + 36 &= 180^\circ \\ 18x &= 144^\circ \\ x &= 8 \end{aligned}$$

5. Find x and $m\angle CAB$



$$\begin{aligned} m\angle FAE &= m\angle CAB \\ 2x &= x + 40 \\ x &= 40 \end{aligned}$$

$$\begin{aligned} m\angle CAB &= x + 40 \\ &= (40) + 40 \\ m\angle CAB &= 80^\circ \end{aligned}$$