BECA / Dr. Huson / 10th Grade Geometry
Learning trajectory: Angle pairs Name:

Angle pairs and angle measure calculations

1. Notation and terminology
2. Complementary and supplementary calculations
3. Algebraic solutions of pair situations
   (a) Linear pairs
   (b) Vertical angles
4. Triangle exterior angles

Draw a linear pair with given measure

1. Given opposite rays $\overrightarrow{AB}$ and $\overrightarrow{AC}$, with $\overline{AB} = 6$ cm. Draw a ray $\overrightarrow{AD}$ such that $m\angle BAD = 60°$ and $\overline{AD} = 6$ cm.

Angle pair short questions

1. The sum of the measures of two supplementary angles equals _____.
2. True or false: The angles making a linear pair are adjacent. _____.
3. The sum of the measures of two complementary angles equals _____.
4. True or false: The angles making a linear pair are complementary. _____.
5. Two vertical angles are supplementary. What are their measures? _____.
6. Sketch a linear pair.

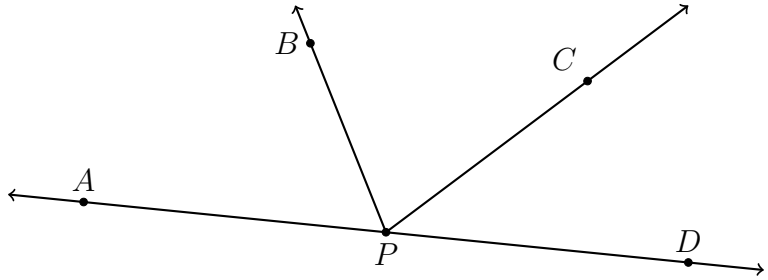
1. *variations*
   True or false: The angles making a linear pair are supplementary. _____.
2. The sum of the measures of two complementary angles equals _____.
3. True or false: Vertical angles are congruent. _____.
4. The sum of the measures of two supplementary angles equals _____.

5. Two vertical angles are complementary. What are their measures? _____.

6. Sketch a pair of vertical angles.

Diagram short questions

1. Given the situation in the diagram, answer each question.



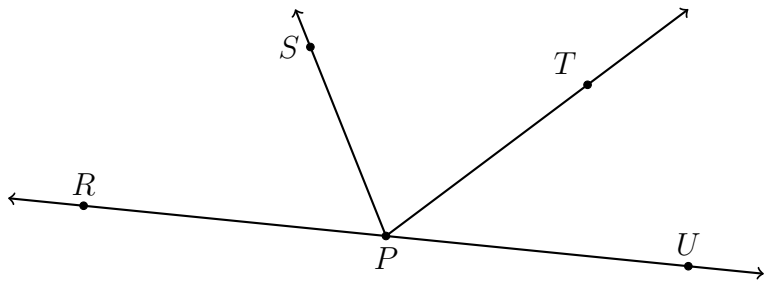
   (a) True or false: $\overrightarrow{PA}$ and $\overrightarrow{PD}$ are opposite rays. _____.

   (b) Name an angle adjacent to $\angle APB$. _____.

   (c) True or false: $\angle APC$ and $\angle CPD$ are supplementary angles. _____.

   (d) Name two angles that constitute a linear pair. _____.

2. *(variation)* Given the situation in the diagram, answer each question.



(a) True or false: $\overrightarrow{PR}$ and $\overrightarrow{PT}$ are opposite rays. _____.

(b) Name an angle adjacent to $\angle TPU$. _____.

(c) True or false: $\angle RPT$ and $\angle SPU$ are supplementary angles. _____.

(d) Name two angles that are adjacent. _____.

Complementary & supplementary arithmetic

1. Given two supplementary angles: $m\angle 1 = 50$, $m\angle 2 = x$.
   Find x.
2. Given two complementary angles: $m\angle 1 = x$, $m\angle 2 = 20$. Find $m\angle 1$.
3. Given two supplementary angles: $m\angle 1 = 135$, $m\angle 2 = x$.
   Find x.
4. Given two complementary angles: $m\angle 1 = x$, $m\angle 2 = 75$. Find $m\angle 1$.
5. Given $m\angle A = 60$, $m\angle B = 20$, $m\angle 1 = 30$, $m\angle DEF = 150$, $m\angle FEG = 10$.

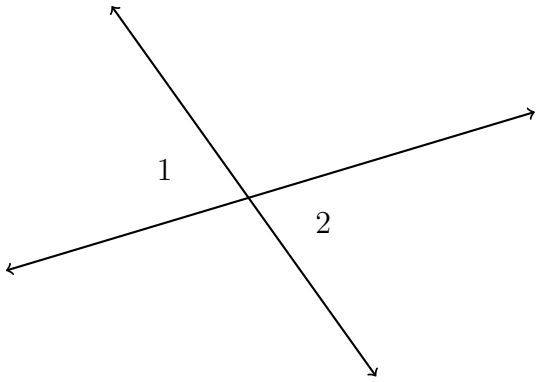
   (a) Find a pair of complementary angles. _____ _____

   (b) Find a pair of supplementary angles. _____ _____

   (c) Spicy: Find a different pair of supplementary angles. _____ _____

Vertical angle algebra

1. Given two vertical angles: $m\angle 1 = 3x + 10$, $m\angle 2 = 2x + 25$. Find $m\angle 1$.
   First label the drawing.



(a) Write a geometric equation: _____ _____

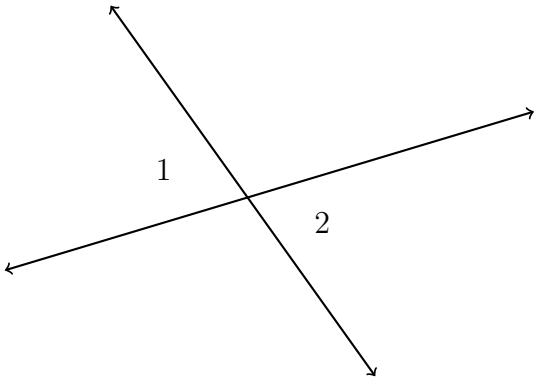
(b) Substitute algebraic values: _____

(c) Solve for x

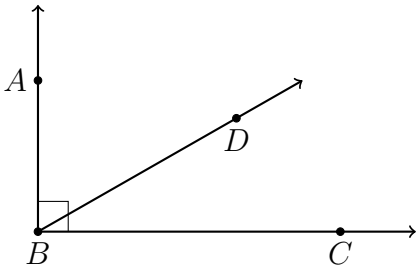
(d) Answer the question:

(e) Check your answer

2. *variation* Given two vertical angles: $m\angle 1 = 7x + 10$, $m\angle 2 = 2x + 45$. Find $m\angle 1$. First label the drawing.

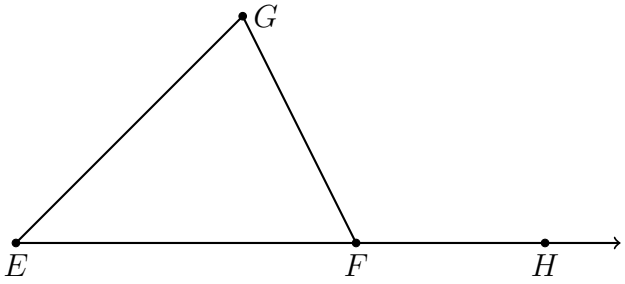


3. *variation* Given two perpendicular rays, $\overrightarrow{BA}$ and $\overrightarrow{BC}$, as shown. $m\angle ABD = 2x + 10$, $m\angle DBC = x + 5$. Find $m\angle DBC$. First label the drawing.

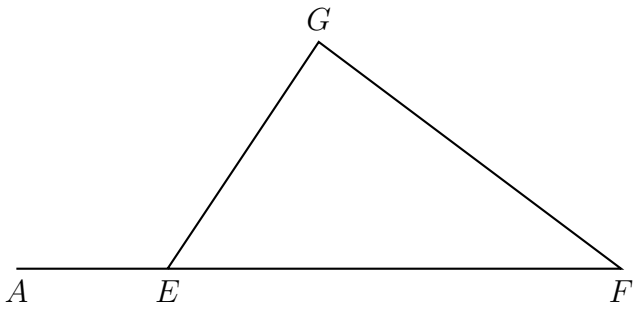


0.0.1 Triangle external angles

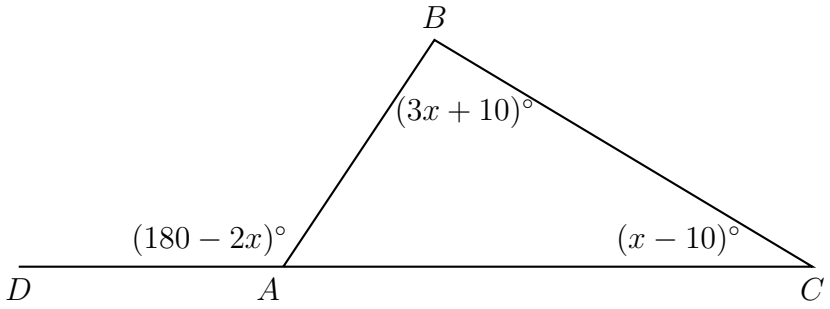
4. Given $m\angle E = 44$, and $m\angle GFH = 112$. Find $m\angle G$.



5. Given $\triangle EFG$ with $\overline{EF}$ extended to A. If $m\angle F = 40°$ and $m\angle AEG = 140°$, what is $m\angle EGF$?



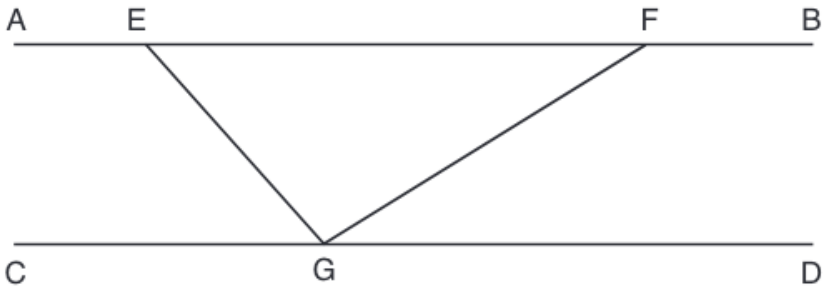
6. In $\triangle ABC$ shown below, side $\overline{AC}$ is extended to point D with $m\angle DAB = (180-2x)°$, $m\angle C = (x-10)°$, and $m\angle B = (3x+10)°$.



What is $m\angle BAC$?

7. Spicy: Regents problem

In the diagram below, $\overline{AEFB} \parallel \overline{CGD}$, and $\overline{GE}$ and $\overline{GF}$ are drawn.



If $m\angle EFG = 32°$ and $m\angle AEG = 137°$, what is $m\angle EGF$?

(1) 11° (3) 75°

(2) 43° (4) 105°