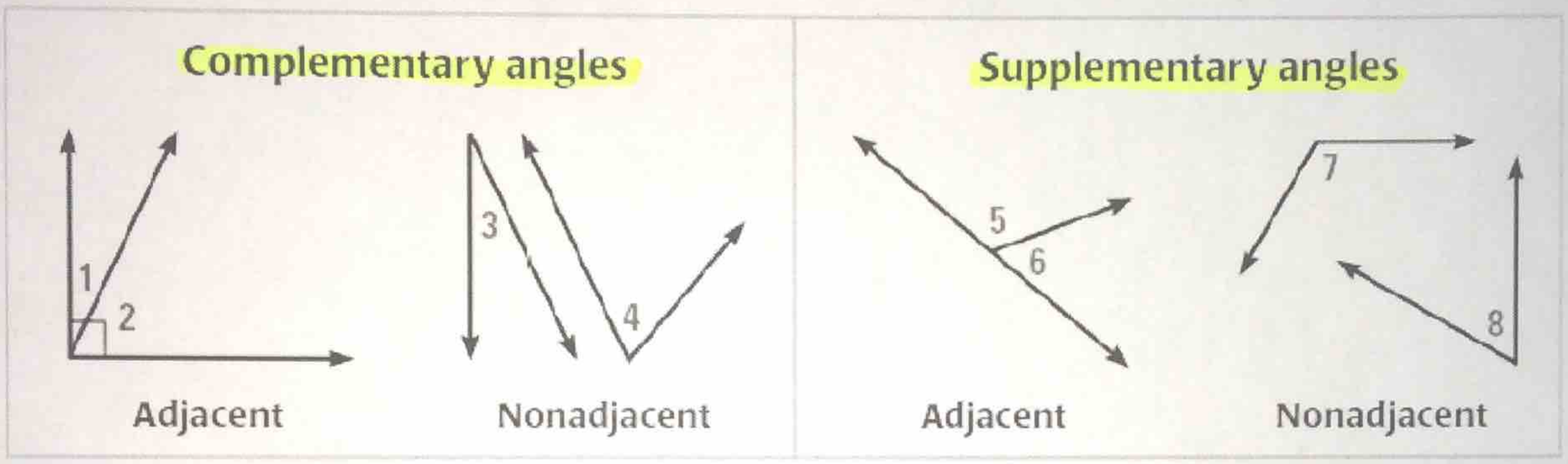
1.5 Describe Angle Pair Relationships

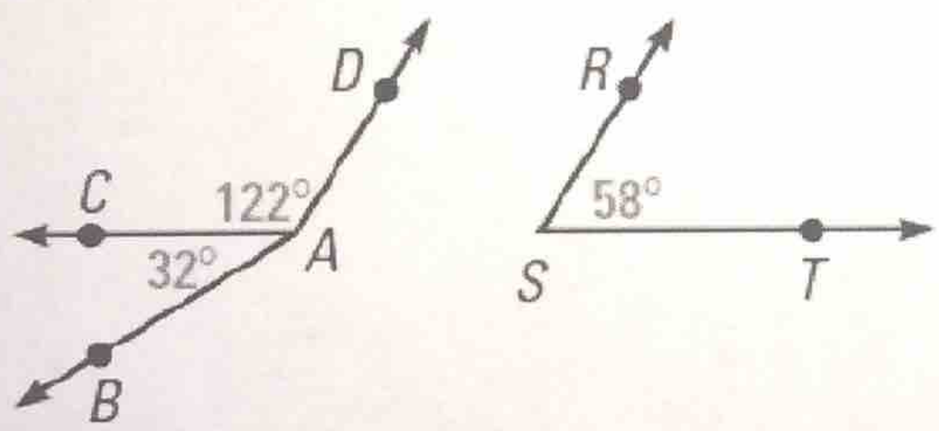
complementary angles – two angles whose sum is 90°

supplementary angles – two angles whose sum is 180°

adjacent angles – two angles that share a common vertex and side, but have no common interior points



Ex 1: In the figure, name a pair of complementary angles, a pair of supplementary angles, and a pair of adjacent angles.

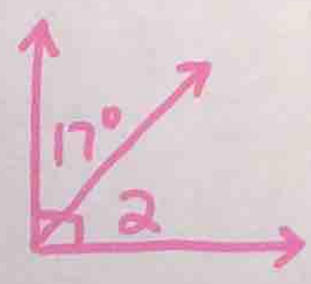


$\angle BAC + \angle RST$ = complementary

$\angle CAD + \angle RST$ = supplementary

$\angle BAC + \angle CAD$ = adjacent

Ex 2: Given that $\angle 1$ is a complement of $\angle 2$ and the $m\angle 1 = 17°$, find $m\angle 2$.



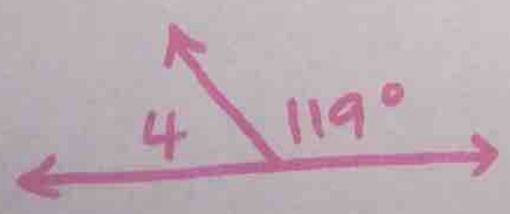
$m\angle 1 + m\angle 2 = 90$

$17 + x = 90$

$x = 73$

$\boxed{m\angle 2 = 73°}$

Ex 3: Given that $\angle 3$ is a supplement of $\angle 4$ and the $m\angle 3 = 119°$, find $m\angle 4$.

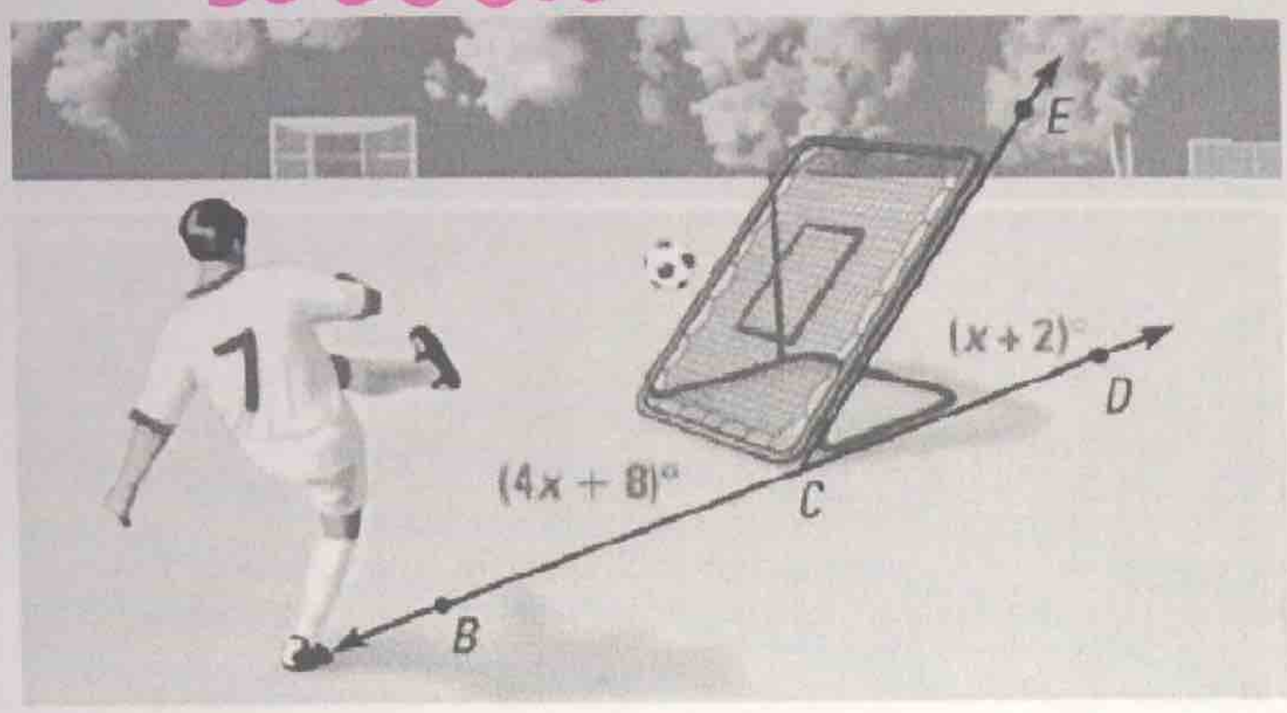


$m\angle 3 + m\angle 4 = 180$

$119 + m\angle 4 = 180$

$\boxed{m\angle 4 = 61°}$

Ex 4: When viewed from the side, the frame of a ball-return net forms a pair of supplementary angles with the ground. Find m ∠BCE and m∠ECD.



$(4x+8)+(x+2)=180$

$5x+10=180$

$5x=170$

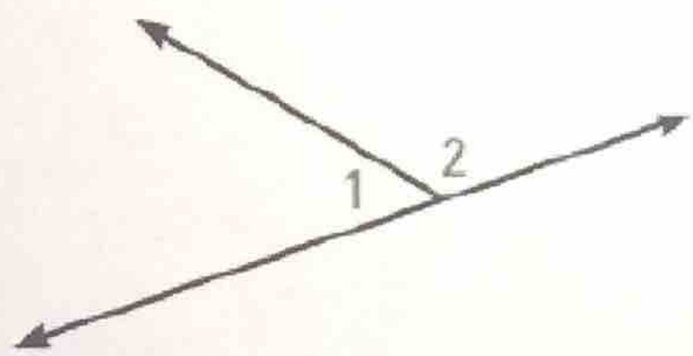
$x=34$

$m\angle BCE = 4x+8$
$= 4(34)+8$
$= 136+8$
$\boxed{m\angle BCE = 144°}$

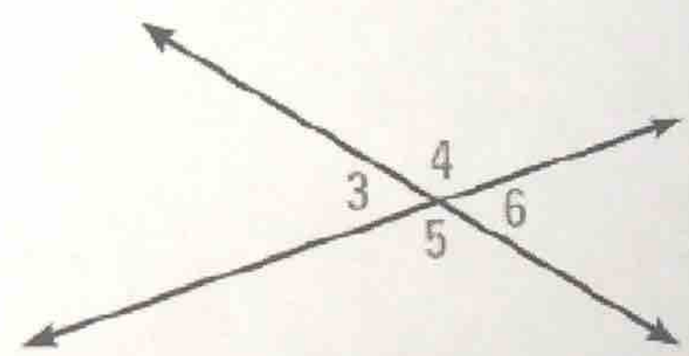
$m\angle ECD = x+2$
$= (34)+2$
$\boxed{m\angle ECD = 36°}$

linear pair - two adjacent angles whose non-common sides are opposite rays (must be exactly TWO angles)

vertical angles - two angles whose sides form two pairs of opposite rays

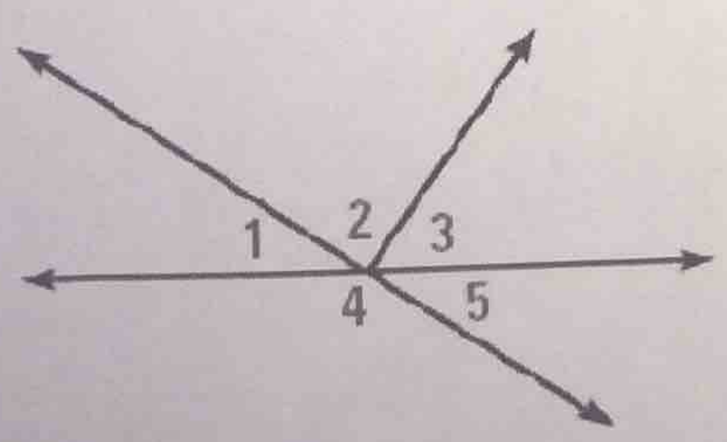


∠1 and ∠2 are a linear pair.



∠3 and ∠6 are vertical angles.
∠4 and ∠5 are vertical angles.

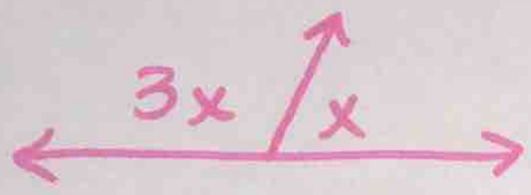
Ex 5: Identify all of the linear pairs and all of the vertical angles in the figure.



∠1 & ∠4 linear
∠4 & ∠5 linear

∠1 & ∠5 vertical

Ex 6: Two angles form a linear pair. The measure of one angle is 3 times the measure of the other angle. Find the measure of each angle.



$x + 3x = 180$

$4x = 180$

$\boxed{x = 45°}$

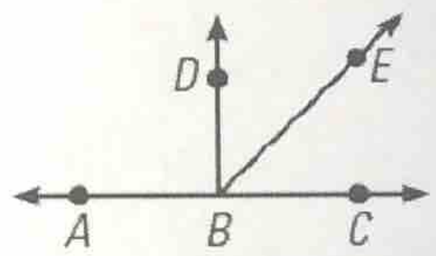
$3x = 3(45)$

$\boxed{3x = 135°}$

CONCEPT SUMMARY — *For Your Notebook*

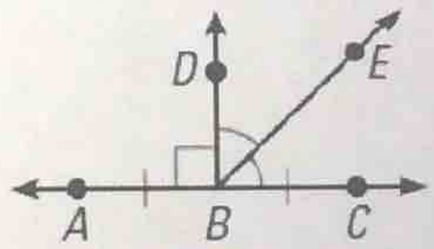
Interpreting a Diagram

There are some things you can conclude from a diagram, and some you cannot. For example, here are some things that you ***can* conclude** from the diagram at the right:



- All points shown are coplanar.
- Points A, B, and C are collinear, and B is between A and C.
- $\overleftrightarrow{AC}$, $\overleftrightarrow{BD}$, and $\overleftrightarrow{BE}$ intersect at point B.
- $\angle DBE$ and $\angle EBC$ are adjacent angles, and $\angle ABC$ is a straight angle.
- Point E lies in the interior of $\angle DBC$.

In the diagram above, you ***cannot* conclude** that $\overline{AB} \cong \overline{BC}$, that $\angle DBE \cong \angle EBC$, or that $\angle ABD$ is a right angle. This information must be indicated, as shown at the right.



Moral of the story: DO NOT ASSUME!