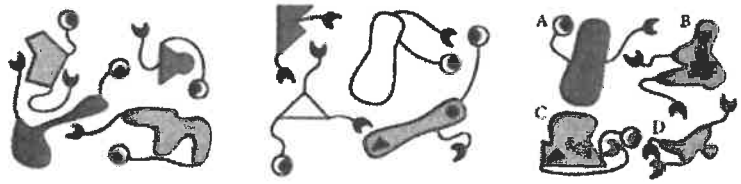
Geometry CC
1.3 What's a Widget

Student Objectives:
The student will be able to write a working definition for types of angles.
The student will be able to use counterexamples to refine definitions.
The student will be able to recall and apply special angle relationships.

Good Definitions are Important!

1. Take a look at the picture below. Which are widgets in the last grouping below?



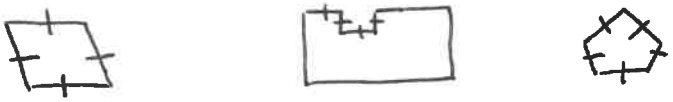
Widgets Not Widgets Which are Widgets?

A
widget
one eye, one arm
colored body

2. Everyone knows that a "square is figure with four equal sides." What is wrong with this definition?

counterexample: an example that disproves a statement

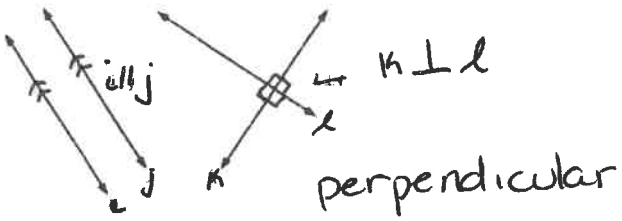
counterexamples:



square: a 4-sided figure that has all sides congruent and all angles measuring 90°

Definition:
1) Classify your term (what is it?)
2) Differentiate your term (what is special about it?)
3) Test your definition by looking for counterexamples

More Markings:



parallel perpendicular

Geometry CC
1.3 What's a Widget

Define:

Parallel Lines are lines in the same plane that never meet

classify

differentiate

Perpendicular Lines are lines that meet at 90°

classify

differentiate

3. Here are some examples and non-examples of special types of angles.
   a. Write a definition for each boldfaced term. Make sure your definitions highlight important differences.
   b. Trade definitions and test each other's definitions by looking for **counterexamples**.
   c. If another group member finds a counterexample to one fo your definitions write a better definitions. As a group decide on the best definition for each term.
   d. We will discuss together as a class!

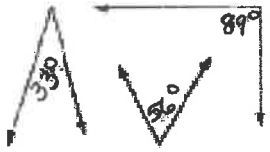
Right Angle

Right angles

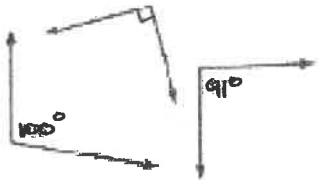
Not right angles

A right angle is an angle that measures 90°

Acute Angle



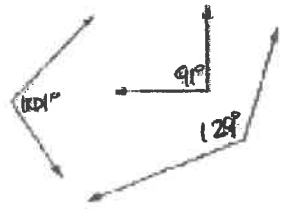
Acute angles



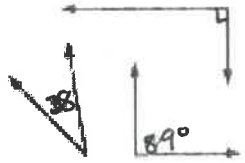
Not acute angles

An acute angle is an angle that measures less than 90°

Obtuse Angle



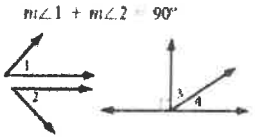
Obtuse angles



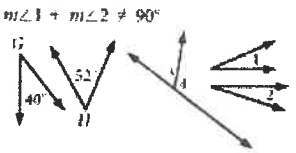
Not obtuse angles

An obtuse angle is an angle that measure greater than 90° but less than 180°

Complementary Angles



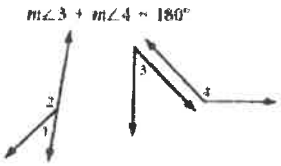
Pairs of complementary angles:
∠1 and ∠2
∠3 and ∠4



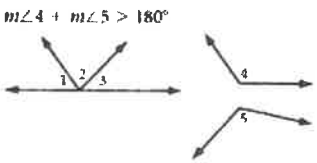
Not pairs of complementary angles:
∠G and ∠H ∠1 and ∠2
∠3 and ∠4

A pair of complementary angles has a sum of 90°

Supplementary Angles



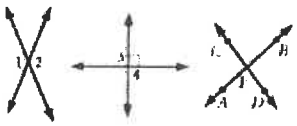
Pairs of supplementary angles:
∠1 and ∠2
∠3 and ∠4



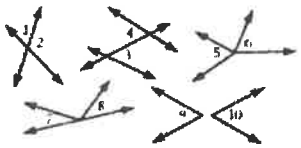
Not pairs of supplementary angles:
∠1, ∠2, and ∠3
∠4 and ∠5

A pair of supplementary angles has a sum of 180°

Vertical Angles



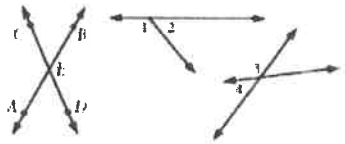
Pairs of vertical angles
∠1 and ∠2
∠3 and ∠4
∠AED and ∠BEC
∠AEC and ∠DEB



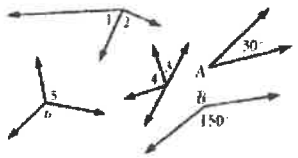
Not pairs of vertical angles:
∠1 and ∠2
∠3 and ∠4
∠5 and ∠6
∠7 and ∠8
∠9 and ∠10

Vertical angles are formed by 2 intersecting lines; they share a common vertex but no common side

Linear Pair of Angles



Linear pairs of angles:
∠1 and ∠2
∠3 and ∠4
∠AED and ∠AEC
∠BED and ∠DEA

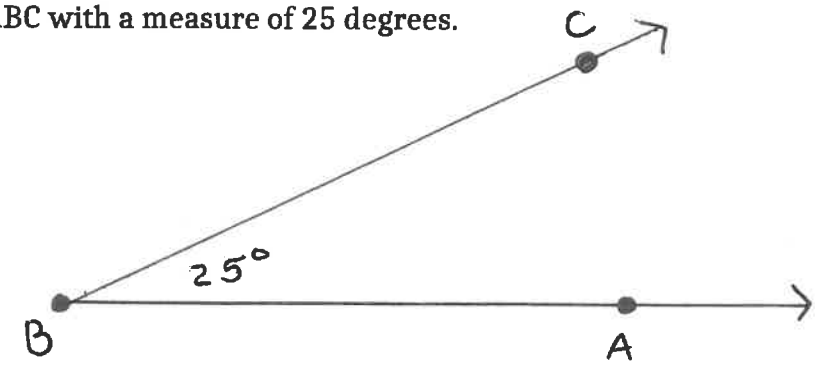


Not linear pairs of angles:
∠1 and ∠2
∠3 and ∠4
∠5 and ∠6
∠A and ∠B

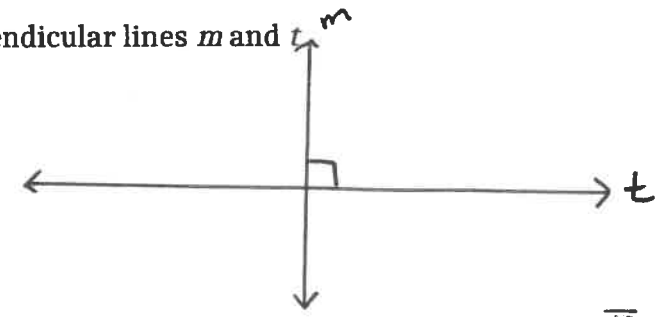
Two angles are a linear pair if they share a vertex and a common side and their noncommon sides form a line

Examples:

1. Draw and carefully label the figures below. Use the appropriate marks to indicate the figures. Use a protractor and ruler.
   a. Acute angle ABC with a measure of 25 degrees.



b. Perpendicular lines m and t



c. Supplementary angles $\angle U$ and $\angle E$ where $\angle U = 35°$

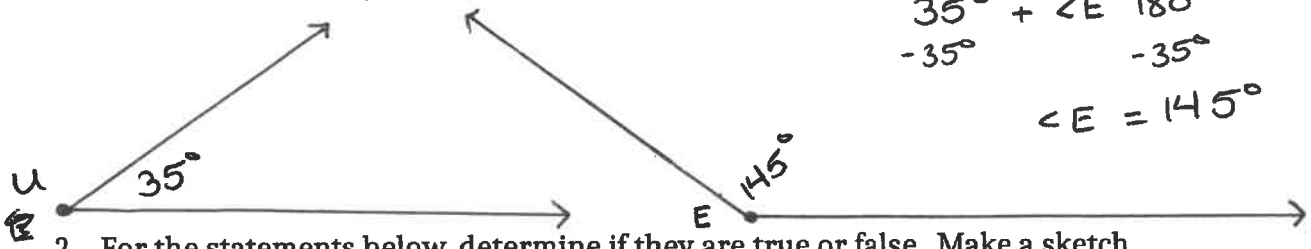
add up to 180°

$\angle U + \angle E = 180°$

$35° + \angle E \; 180°$

$-35° \qquad -35°$

$\angle E = 145°$



2. For the statements below, determine if they are true or false. Make a sketch demonstrating each true statement. For each false statement, draw a counterexample.

   a. For every line segment there is exactly one midpoint.

   b. If $CA = AT$, then A is the midpoint of $\overline{CT}$.

   c. If two different circles intersect, then they intersect at one and only one point.

d. If $m\angle D = 40°$ and $m\angle C = 140°$, then the angles are a linear pair.