

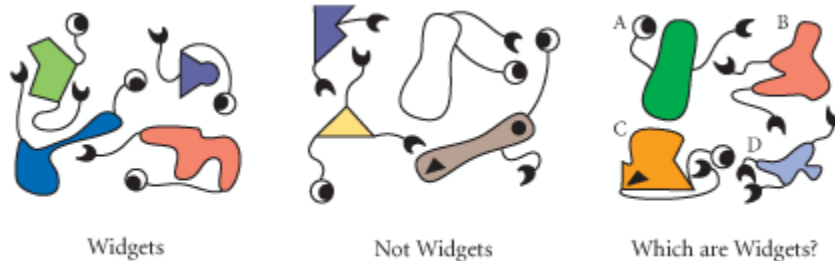
Lesson 1.3: What's a Widget?

In this lesson you will:

- learn how to write a good definition
- write definitions for geometric terms
- test definitions by looking for counterexamples

Good definitions are very important in geometry. In this lesson you will write your own geometry definitions.

Which creatures in the last group are Widgets?



By observing what a Widget is and what a Widget isn't, you identified the characteristics that distinguish a Widget from a non-Widget. This same process can help you write good definitions of geometric figures. First, you classify what it is and then you say how it differs from others. What should go in the blanks to define a square?

A square is a that .

Classify it. What is it? How does it differ from others?

Once you have written a definition, you should test it. To do this, you look for a counterexample. That is, try to create a figure that fits your definition but isn't what you're trying to define. If you can come up with a counterexample for your definition, you don't have a good definition.

•Example 1: Everyone knows, "A square is a figure with four equal sides." What's wrong with this definition?

a.) Sketch a counterexample. (You can probably find more than one!)

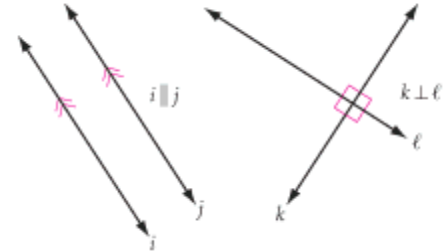
b.) Write a better definition for a square.

Beginning Steps to Creating a Good Definition

1. Classify your term. What is it?
2. Differentiate your term. How does it differ from others in that class?
3. Test your definition by looking for a counterexample.

Ready to write a couple of definitions? First, here are two more types of markings that are very important in geometry.

The same number of arrow marks indicates that lines are parallel. The symbol \parallel means “is parallel to.” A small square in the corner of an angle indicates that it measures 90° . The symbol \perp means “is perpendicular to.”



•Example 2: Define these terms:

a.) Parallel lines

b.) Perpendicular lines

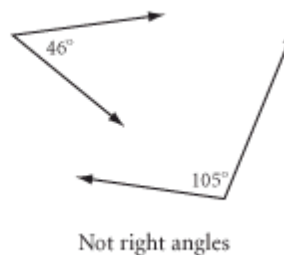
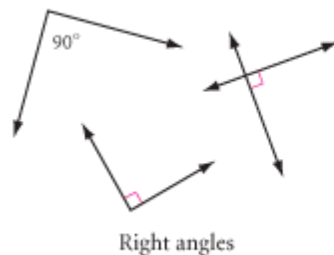
*Add these definitions to your dictionary.

Investigation 1.3: “Defining Angles”

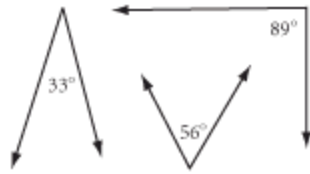
Here are some examples and non-examples of special types of angles.

A.) Write a definition for each boldfaced term. Make sure your definitions highlight important differences. Compare with your group. Come to an agreement on a definition.

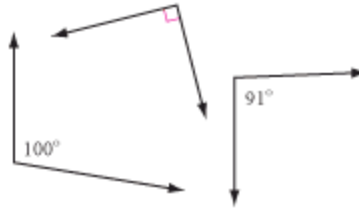
RIGHT ANGLE



ACUTE ANGLE

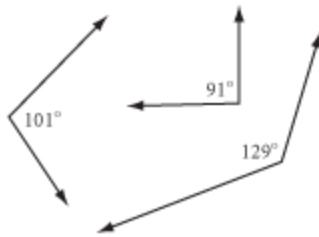


Acute angles

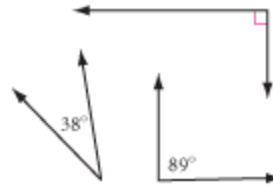


Not acute angles

OBTUSE ANGLE



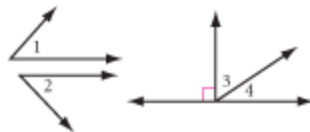
Obtuse angles



Not obtuse angles

COMPLEMENTARY ANGLES

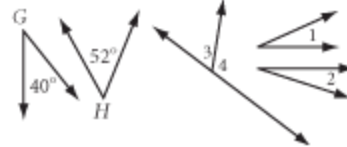
$$m\angle 1 + m\angle 2 = 90^\circ$$



Pairs of complementary angles:

- $\angle 1$ and $\angle 2$
- $\angle 3$ and $\angle 4$

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

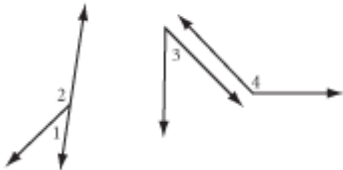


Not pairs of complementary angles:

- $\angle G$ and $\angle H$
- $\angle 1$ and $\angle 2$
- $\angle 3$ and $\angle 4$

SUPPLEMENTARY ANGLES

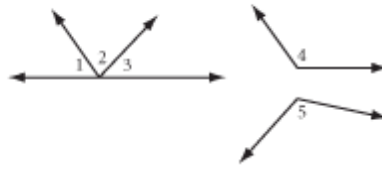
$$m\angle 3 + m\angle 4 = 180^\circ$$



Pairs of supplementary angles:

- $\angle 1$ and $\angle 2$
- $\angle 3$ and $\angle 4$

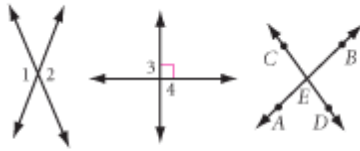
$$m\angle 4 + m\angle 5 > 180^\circ$$



Not pairs of supplementary angles:

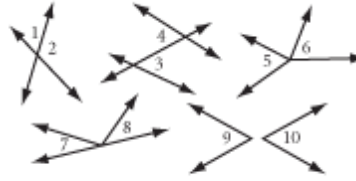
- $\angle 1$, $\angle 2$, and $\angle 3$
- $\angle 4$ and $\angle 5$

VERTICAL ANGLES



Pairs of vertical angles:

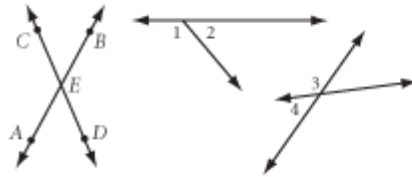
- $\angle 1$ and $\angle 2$
- $\angle 3$ and $\angle 4$
- $\angle AED$ and $\angle BEC$
- $\angle AEC$ and $\angle DEB$



Not pairs of vertical angles:

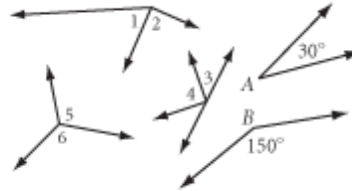
- $\angle 1$ and $\angle 2$
- $\angle 3$ and $\angle 4$
- $\angle 5$ and $\angle 6$
- $\angle 7$ and $\angle 8$
- $\angle 9$ and $\angle 10$

LINEAR PAIR OF ANGLES



Linear pairs of angles:

- $\angle 1$ and $\angle 2$
- $\angle 3$ and $\angle 4$
- $\angle AED$ and $\angle AEC$
- $\angle BED$ and $\angle DEA$



Not linear pairs of angles:

- $\angle 1$ and $\angle 2$
- $\angle 3$ and $\angle 4$
- $\angle 5$ and $\angle 6$
- $\angle A$ and $\angle B$

B.) Once everyone is done, as a class, agree on common definitions. Add these to your dictionary.

⇒ASSIGNMENT: _____