



# GRADE 4 SUPPLEMENT

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## Set C4 Geometry: Triangles & More

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### Skills & Concepts

- ★ exemplify points, lines, line segments, rays, and angles
- ★ classify triangles by the length of their sides as either scalene, isosceles, or equilateral
- ★ classify triangles by the size of their angles as either acute, obtuse, or right
- ★ use appropriate tools to measure objects to the nearest half inch and nearest quarter inch
- ★ classify angles as either right, acute, or obtuse
- ★ identify the specific attributes of circles: center, radius, circumference, and diameter

**Bridges in Mathematics Grade 4 Supplement**

**Set C4** Geometry: Triangles & More

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*Bridges in Mathematics* is a standards-based K–5 curriculum that provides a unique blend of concept development and skills practice in the context of problem solving. It incorporates the Number Corner, a collection of daily skill-building activities for students.

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# Set C4 ★ Activity 1



## ACTIVITY

### Start with a Point

#### Overview

The teacher leads the class through a series of drawing tasks on a set of 4 overhead transparencies. As they progress from one task to the next, students construct and discuss points, line segments, lines, rays, and angles. Then students experiment with the idea that if you connect any 3 points, you get a triangle.

#### Skills & Concepts

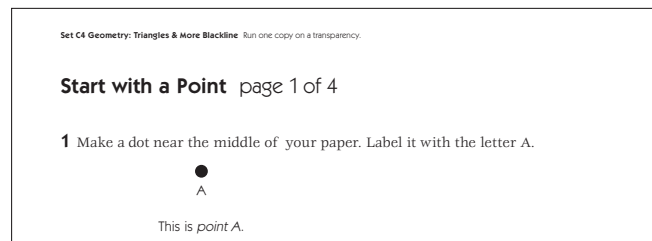
- ★ exemplify points, lines, line segments, rays, and angles
- ★ use appropriate tools to measure objects to the nearest half inch and the nearest quarter inch
- ★ classify angles as either right, acute, or obtuse

#### You'll need

- ★ Start with a Point, (pages C4.5–C4.8, run a copy of each sheet on a transparency)
- ★ several sheets of unlined paper for each student (newsprint or copy paper is fine)
- ★ class set of rulers
- ★ a piece of paper to mask parts of the overhead.

#### Instructions for Start with a Point

1. Ask students to get their pencils and rulers out. Give them each 2 sheets of paper and have them label both with their name. Explain that they are going to follow a set of instructions to draw some geometric figures today.
2. Place the first transparency on display at the overhead. Mask all but the first drawing task. Read it with the students and give them a moment to complete the task.



3. Show the example below Task 1. Discuss the fact that students have drawn what mathematicians call a point. A point is an exact location in space. Points are usually marked with letter names, and the point in task 1 is labeled A.
4. Now reveal the second drawing task. Read it with the class. Give students a minute to find, mark, and label point B exactly  $3\frac{1}{2}$ " away from point A. Let them know that they can locate point B anywhere on their paper relative to point A: above, below, or to the side. The only requirement is that it be placed at a distance of  $3\frac{1}{2}$ " from point A.
5. Show them the example of point B on the overhead. Does it match their drawing exactly? Why or why not?

**Activity 1** Start with a Point (cont.)

**Students** Point B up there goes exactly sideways from point A. I made my point B going down from point A.

I made point B going up from point A.

It's still  $3\frac{1}{2}$ " away. It's just in a different place than mine.

Some of the students may realize that all possible choices for point B form a circle with A as its center.

6. Reveal the third drawing task. Read it with the class and give them a moment to connect points A and B on their papers. Then show the example below Task 3. Explain that the students have just constructed what mathematicians call a line segment. A line segment is part of a line. A line segment is named by using its two endpoints, so this one would be called line segment  $\overline{AB}$ . How is their line segment  $\overline{AB}$  the same as the one on the overhead? How is it different?

**Students** My line segment AB goes up and down. That one goes across the paper.

Mine goes diagonal.


Mine goes kind of across but it's a little tipped.

They are all straight though, and they are all  $3\frac{1}{2}$ " long.

Set C4 Geometry: Triangles & More Blackline Run one copy on a transparency.


**Start with a Point** page 1 of 4

**1** Make a dot near the middle of your paper. Label it with the letter A.




This is point A.

**2** Make another dot exactly  $3\frac{1}{2}$  inches away from point A. Label this dot with the letter B.



This is point B.

**3** Use your ruler and pencil to connect points A and B.



This is line segment  $\overline{AB}$ . How long is this line segment?

7. Work your way through the drawing tasks and examples on the rest of sheet 1, as well as sheets 2–4 in a similar fashion. As you do so, guide students toward the following understandings:

- A line segment starts at one point and ends at another. Because it starts and stops, you can measure its length. When we draw a line on a piece of paper, it is actually just a line segment, or a part of a line.
- A line goes on and on forever in either direction. You cannot measure its length because it never stops. People show this by placing a small arrow at either end of a line segment, but you can't really draw a line, because a line is infinitely long.
- A ray is part of a line. It has one endpoint and goes on forever in one direction. It's kind of like the rays that shine out of a flashlight.
- Line segments, lines, and rays can all be named using the points that define them. A line segment with endpoints A and B is called line segment  $\overline{AB}$ . A line that runs through points A and B is called line  $\overleftrightarrow{AB}$ . A ray that has point A as an endpoint and runs through point B is called ray  $\overrightarrow{AB}$ .
- The markings above AB (  $\leftrightarrow$ ,  $\rightarrow$ , or  $—$  ) indicate whether AB represents a line segment, line, or ray.

**Activity 1** Start with a Point (cont.)


- An angle is formed when two rays meet at an endpoint. The endpoint is called the vertex of the angle. An angle can be named most easily using just the letter of the vertex. The first angle students draw will be angle C. The second angle they draw will be angle F.
- Angles can be acute, obtuse, or right. Ask students to identify what kinds of angles they draw, and note that angle C on the overhead is acute.

8. As you go, reassure students that it is fine if their drawings do not look identical to the ones on the overhead. In fact, if you show each example on the overhead after students complete the task above it, they will have an opportunity to see that there are many different ways to respond to the same prompt. Although everyone's line segment  $\overline{CD}$  should be exactly  $4\frac{1}{4}$  inches, some students' line segments may go vertically. Others may go horizontally or diagonally across the page.

Set C4 Geometry: Triangles & More Blackline Run one copy on a transparency.


**Start with a Point** page 1 of 4

**1** Make a dot near the middle of your paper. Label it with the letter A.



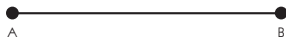
This is *point A*.

**2** Make another dot exactly  $3\frac{1}{2}$  inches away from point A. Label this dot with the letter B.



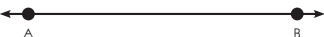
This is *point B*.

**3** Use your ruler and pencil to connect points A and B.



This is *line segment  $\overline{AB}$* . How long is this line segment?

**4** Use your ruler to make line segment  $\overline{AB}$  half an inch longer in both directions. Draw a little arrowhead at both ends. The little arrowheads show that the line that goes through points A and B could go on and on forever.




This is *line  $\overleftrightarrow{AB}$* . What is the difference between a line segment and a line?


Set C4 Geometry: Triangles & More Blackline Run one copy on a transparency.

**Start with a Point** page 2 of 4


**5** Turn your paper over. Draw and label *point C* near the middle of your paper.




**6** Make a dot exactly  $4\frac{1}{4}$  inches away from point C. Label it *point D*.



**7** Use your ruler and pencil to connect points C and D. Is this a line, or a line segment? How do you know?



**8** Make line segment  $\overline{CD}$  go a quarter of an inch past point D. Draw a little arrowhead on that end.



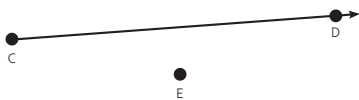
This is *ray  $\overrightarrow{CD}$* . A ray is part of a line. It has an endpoint (point C), but the little arrowhead shows it could go on and on forever through point D in the other direction. It's kind of like a ray of light coming from a flashlight.

## Activity 1 Start with a Point (cont.)

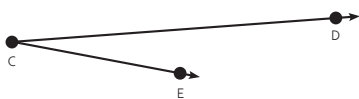
Set C4 Geometry: Triangles &amp; More Blackline Run one copy on a transparency.

## Start with a Point page 3 of 4

9 Now make a dot  $2\frac{1}{4}$  inches away from point C. Make sure it doesn't land anywhere along line CD. Label it *point E*.



10 Use your ruler and pencil to draw ray  $\vec{CE}$ .



This is angle  $\angle C$ . Is your angle acute, obtuse, or right? How do you know?

11 Get another piece of paper. Draw and label:

- Point F
- Point G
- Point H (not along line FG)
- Ray  $\vec{FG}$
- Ray  $\vec{FH}$

What is the name of this figure?

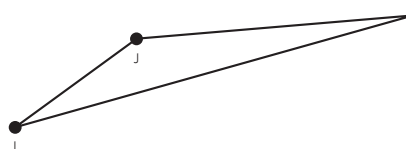
Set C4 Geometry: Triangles &amp; More Blackline Run one copy on a transparency.

## Start with a Point page 4 of 4

12 Turn your paper over. Draw 3 points on the page. Make sure they don't all fall along the same line. Label the *points I, J, and K*.



13 Use your ruler to draw line segments  $\overline{IJ}$ ,  $\overline{JK}$ , and  $\overline{KI}$ . What is the name of this figure? How do you know?



14 Dave says that if you draw line segments between any 3 points, you will always get a triangle. Try Dave's idea at least 3 times. Does it always work? Can you find an example that doesn't work?

The last task on Sheet 4 invites students to try experimenting with the idea that you will always get a triangle if you connect 3 points with line segments. Ask them to discuss the idea and then try it for themselves. Encourage them to draw as many different examples as time allows. Does it always work? Do the triangles that result all look the same? Can they find an example that doesn't work? If you leave this as an open question, some students may continue to ponder and experiment for days to come. Some students may discover that if you locate all 3 points along the same line and connect them, you get a line segment rather than a triangle.



## INDEPENDENT WORKSHEET

Use Set C4 Independent Worksheets 1 and 2 to provide students with more practice constructing and identifying points, line segments, lines, rays, and angles.

# Start with a Point page 1 of 4

1 Make a dot near the middle of your paper. Label it with the letter A.



This is *point A*.

2 Make another dot exactly  $3\frac{1}{2}$  inches away from point A. Label this dot with the letter B.



This is *point B*.

3 Use your ruler and pencil to connect points A and B.



This is *line segment  $\overline{AB}$* . How long is this line segment?

4 Use your ruler to make line segment  $\overline{AB}$  half an inch longer in both directions. Draw a little arrowhead at both ends. The little arrowheads show that the line that goes through points A and B could go on and on forever.



This is *line  $\overleftrightarrow{AB}$* . What is the difference between a line segment and a line?

## Start with a Point page 2 of 4

**5** Turn your paper over. Draw and label *point C* near the middle of your paper.



**6** Make a dot exactly  $4\frac{1}{4}$  inches away from point C. Label it *point D*.



**7** Use your ruler and pencil to connect points C and D. Is this a line, or a line segment? How do you know?



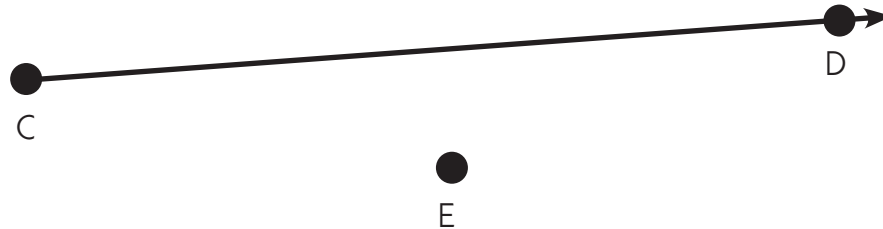
**8** Make line segment  $\overline{CD}$  go a quarter of an inch past point D. Draw a little arrowhead on that end.



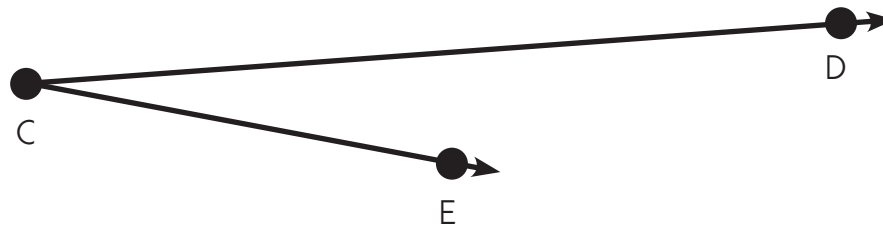
This is ray  $\overrightarrow{CD}$ . A ray is part of a line. It has an endpoint (point C), but the little arrowhead shows it could go on and on forever through point D in the other direction. It's kind of like a ray of light coming from a flashlight.

## Start with a Point page 3 of 4

**9** Now make a dot  $2\frac{1}{4}$  inches away from point C. Make sure it doesn't land anywhere along line CD. Label it *point E*.



**10** Use your ruler and pencil to draw ray  $\vec{CE}$ .



This is angle  $\angle C$ . Is your angle acute, obtuse, or right? How do you know?

**11** Get another piece of paper. Draw and label:

- Point F
- Point G
- Point H (not along line FG)
- Ray  $\vec{FG}$
- Ray  $\vec{FH}$

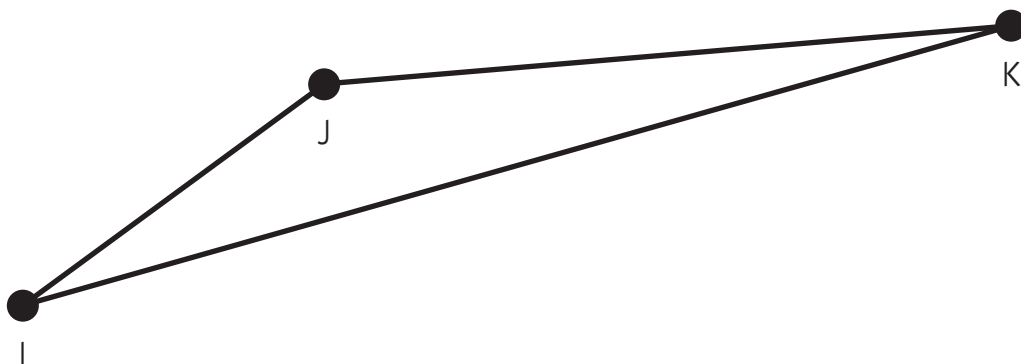
What is the name of this figure?

## Start with a Point page 4 of 4

**12** Turn your paper over. Draw 3 points on the page. Make sure they don't all fall along the same line. Label the *points*  $I$ ,  $J$ , and  $K$ .



**13** Use your ruler to draw line segments  $\overline{IJ}$ ,  $\overline{JK}$ , and  $\overline{KI}$ . What is the name of this figure? How do you know?



**14** Dave says that if you draw line segments between any 3 points, you will always get a triangle. Try Dave's idea at least 3 times. Does it always work? Can you find an example that doesn't work?

# Set C4 ★ Activity 2



## ACTIVITY

### Classifying Triangles

#### Overview

Students build and record four different triangles on their geoboards. Then they classify their triangles, first by angle size and then by side length.

#### Skills & Concepts

- ★ classify triangles by the length of their sides as either scalene, isosceles, or equilateral
- ★ classify triangles by the size of their angles as either acute, obtuse, or right
- ★ use appropriate tools to measure objects to the nearest quarter inch
- ★ classify angles as either right, acute, or obtuse

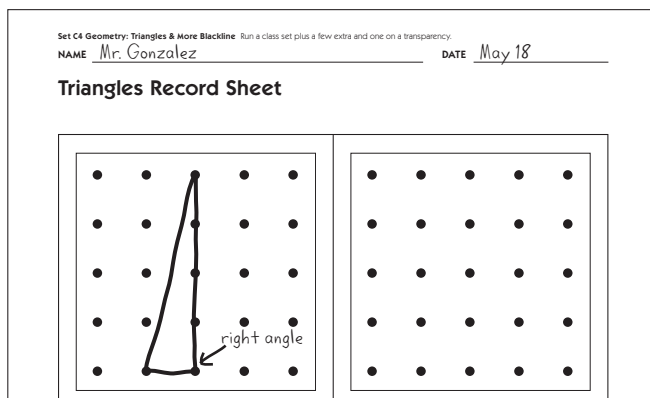
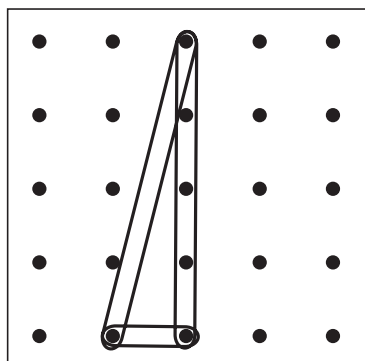
#### You'll need

- ★ Triangles Record Sheet (page C4.13, class set plus a few extra and one copy on a transparency)
- ★ Types of Triangles (page C4.14, run one copy on a transparency)
- ★ overhead geoboard
- ★ class set of geoboards
- ★ rubber bands
- ★ class set of rulers
- ★ a piece of paper to mask parts of the overhead
- ★ Word Resource Cards: acute angle, obtuse angle, right angle (see Advance Preparation)

**Advance Preparation** Post the Word Resource Cards where all the students can see them clearly before you conduct this activity.

#### Instructions for Classifying Triangles

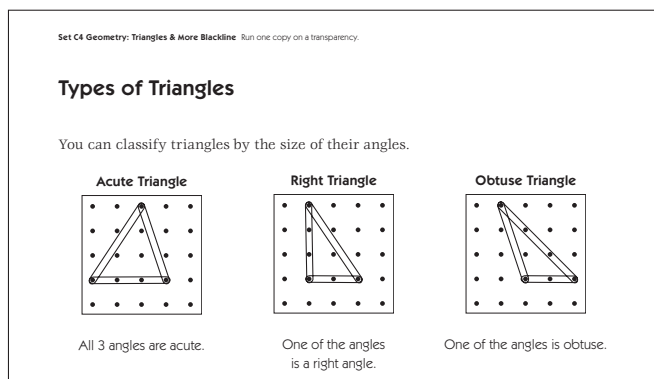
1. Ask students to get out their rulers and pencils. Then give them each a geoboard and a copy of the Triangles Record Sheet. Explain that they are going to make and record 4 different triangles today. Demonstrate by making a triangle on a geoboard at the overhead. If necessary, review any guidelines you have established with the class for handling the rubber bands carefully. Then copy your triangle onto the Triangles Record Sheet transparency. Solicit advice from students about how to do this carefully and accurately as you are working.



**Activity 2** Classifying Triangles (cont.)

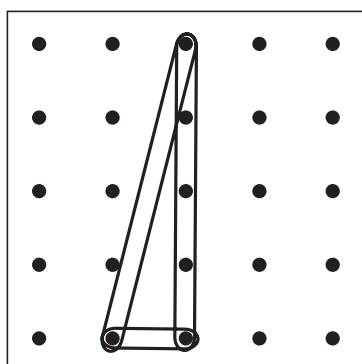
2. When students understand what to do, pass out the rubber bands and let them get started. Remind them to make 4 different triangles. Encourage them to make triangles that are different than the one you made, and different from the ones their neighbors are making. Circulate as they are working to talk with them about their triangles. What kinds of angles do they notice as they create their triangles? Can they point out acute, obtuse, and /or right angles in their work?

3. When most students have finished, reconvene the class. Explain that they are going to discover and record the types of triangles they have just created. Show just the top portion of Types of Triangles at the overhead.



4. Read and discuss the information with the class. Ask volunteers to work with the support of the pictures on the Word Resource Cards to describe each type of angle. Then have volunteers mark and label the acute angles on the first triangle, the right angle on the second triangle, and the obtuse angle on the third triangle. Then ask the students to help you classify the triangle you made on your geoboard.

**Teacher** *What kind of triangle did I make when I introduced this activity? I'll hold up my geoboard so you can see it while you look at the different types of triangles on the overhead. Pair-share with the person next to you, and raise your hand when you have an idea.*




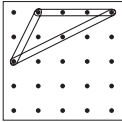
**Students** *I think it's an acute triangle because it's really skinny. It's none of those because it doesn't look like any of them. None of the ones up there are that skinny. I think it might be a right triangle. I'm pretty sure that angle on the bottom is a right angle. Can we test it out? Let's see if a square pattern block will fit in that corner.*

You may have to help students understand that a triangle doesn't have to look exactly like the ones on the overhead to fit into one of the three categories. If necessary, build several more triangles on your board and have the students work together to classify them.

### Activity 2 Classifying Triangles (cont.)

- When students understand what to do, have them work in pairs to help each other classify the triangles on their record sheets by angle size, and mark and label the relevant triangles. Ask them to record the classification on the first line in the box below each triangle.
- As students finish their work, have them talk with others nearby. If there are disagreements, encourage students to work together to resolve them. How can they be sure if an angle is acute, right, or obtuse?
- When most students have finished, reconvene the class and display the other half of the Triangle Types overhead. Read and discuss the information with students.

You can also classify triangles by the length of their sides.

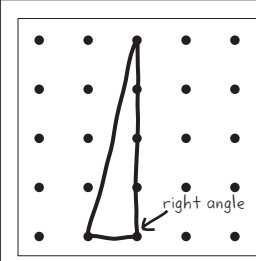
<p><b>Isosceles Triangle</b></p>  <p>Two sides are the same length.</p>	<p><b>Scalene Triangle</b></p>  <p>Each side is a different length.</p>	<p><b>Equilateral Triangle</b></p> <p>Each side is the same length.</p> <p>Are any of the triangles you made on the geoboard equilaterals?</p> <p>Can you make an equilateral triangle on a geoboard?</p> <p>Why or why not?</p>
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- Ask students to help you classify the triangle you made on your geoboard by measuring each side length to the nearest quarter-inch. Remind them that a triangle doesn't have to look exactly like one of the examples on the overhead to fit one of the categories. When they have come to agreement, record the information on your record sheet.

Set C4 Geometry: Triangles & More Blackline Run a class set plus a few extra and one on a transparency.

NAME Mr. Gonzalez DATE May 18

### Triangles Record Sheet

	
Right Triangle, Scalene Triangle	

- Have students work in pairs to classify their own triangles by side length and record the information on their sheets. If time runs out, ask students to complete their sheets during a designated seatwork period the following day. Post the Triangle Types overhead for their reference.
- A time allows, ask students to share and compare some of the triangles they made. Let them know that it is, in fact, impossible to create an equilateral triangle on this geoboard. If any of the students believe they have created an equilateral triangle, have them share it with the class, and work together to measure the sides to the nearest quarter-inch. While the side lengths may be very close, they will not be equal.

## Activity 2 Classifying Triangles (cont.)



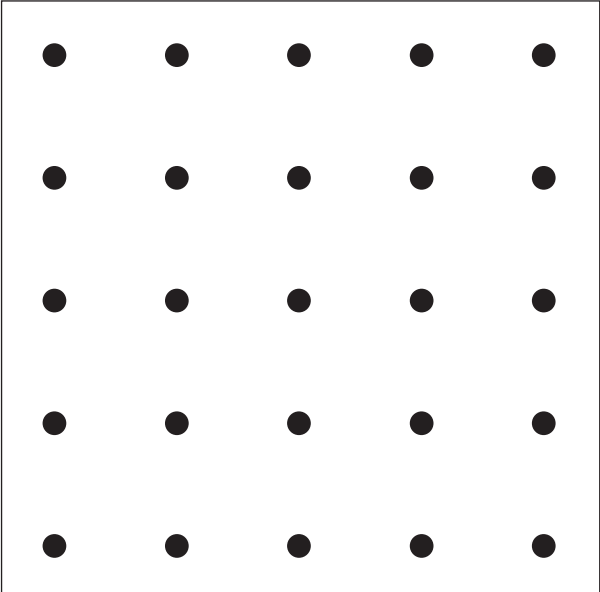
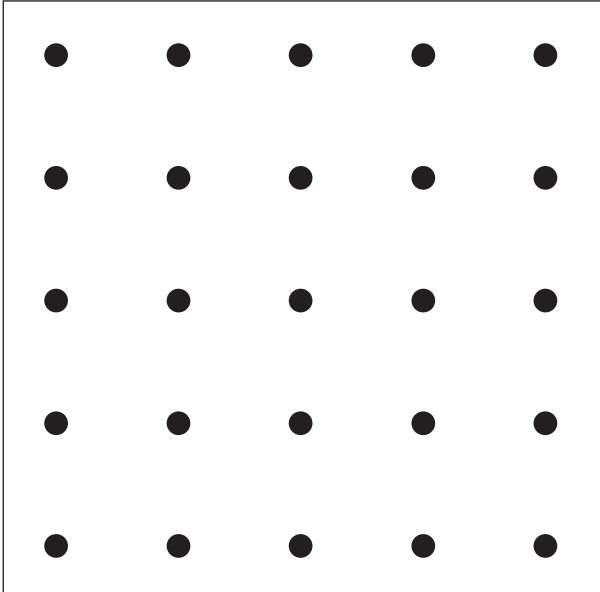
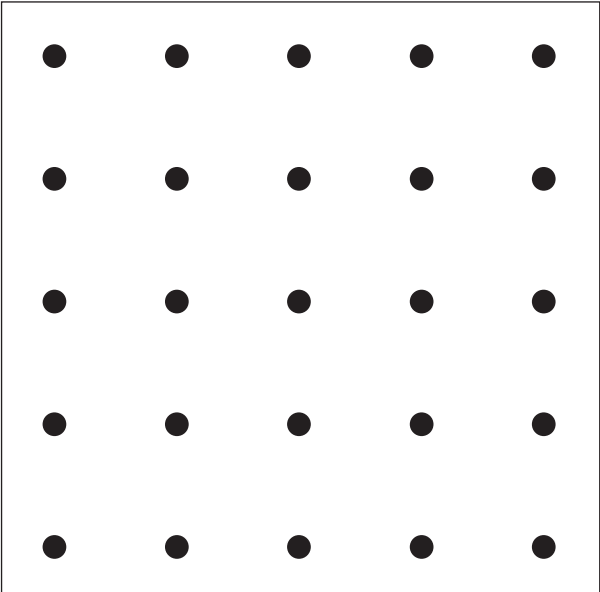
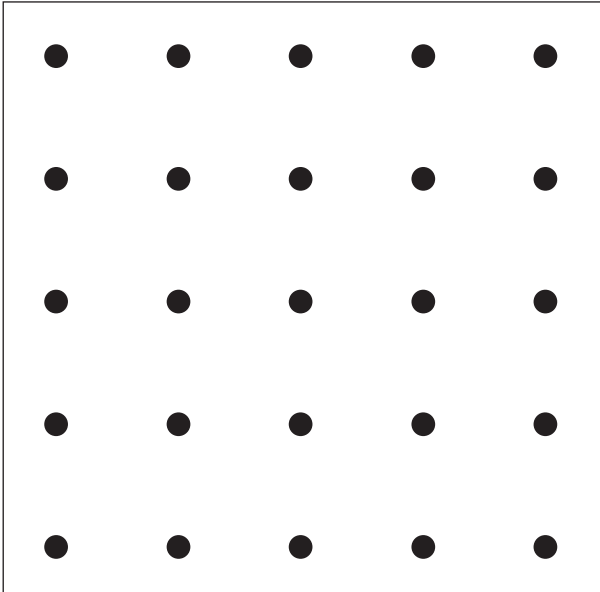
### INDEPENDENT WORKSHEET

Use Set C4 Independent Worksheets 3 and 4 to provide students with more practice classifying triangles by angle size and side length.

NAME \_\_\_\_\_

DATE \_\_\_\_\_

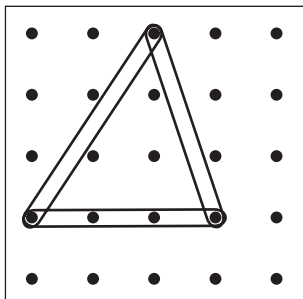
# Triangles Record Sheet

# Types of Triangles

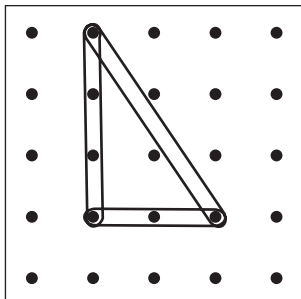
You can classify triangles by the size of their angles.

## Acute Triangle



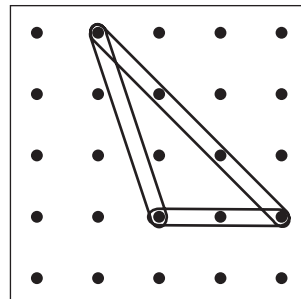
All 3 angles are acute.

## Right Triangle



One of the angles is a right angle.

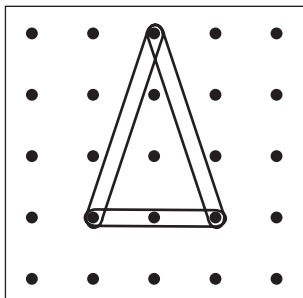
## Obtuse Triangle



One of the angles is obtuse.

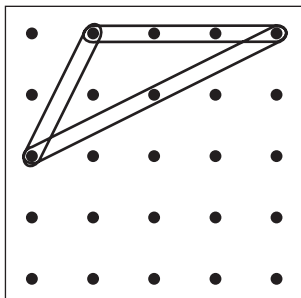
You can also classify triangles by the length of their sides.

## Isosceles Triangle



Two sides are the same length.

## Scalene Triangle



Each side is a different length.

## Equilateral Triangle

Each side is the same length.

Are any of the triangles you made on the geoboard equilaterals?

Can you make an equilateral triangle on a geoboard?

# Set C4 ★ Activity 3



## ACTIVITY

### Measuring Circles

#### Overview

Students share what they already know about circles. The teacher introduces a set of circle words, and works with input from the class to label a circle at the overhead. Students then measure the radius and diameter of several circles and share ideas about how these dimensions might relate to each other.

#### Skills & Concepts

- ★ identify the specific attributes of circles: center, radius, circumference, and diameter
- ★ exemplify points and line segments
- ★ use appropriate tools to measure to the nearest half inch
- ★ represent fractions that are greater than or equal to 1

#### You'll need

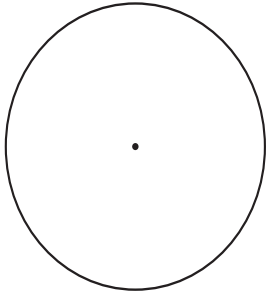
- ★ A Circle (page C4.18, run one copy on a transparency)
- ★ Circles (page C4.19, run several copies and cut apart; each student will need one circle)
- ★ Circles to Label & Measure (page C4.20, run a class set)
- ★ class set of rulers
- ★ scissors and pencils
- ★ a piece of paper to mask parts of the overhead
- ★ 2 feet of string for each pair of students (optional)

#### Instructions for Measuring Circles

1. Place just the top portion of A Circle on display at the overhead. Ask students to pair-share anything they already know about this shape, and any observations they can make about it. Then call on volunteers to share their ideas with the class as you record at the overhead.

Set C4 Geometry: Triangles & More Blackline Run one copy on a transparency.

### A Circle



**Our Observations**

- circle
- round
- round all the way around
- has a center
- shaped like the full moon, a wheel, the sun, and lots of other things
- the top and bottom of a cylinder are shaped like a circle.

2. Reveal the first word on the vocabulary list at the bottom of the overhead: center. Ask students to explain where the center of the circle is and how they know. Is there any way they can prove that it is the center? After some discussion, give students each a copy of the circle. Explain that it is an exact copy of the one on the overhead. Ask them to work in pairs to see if the point that appears to be in the middle of this circle is actually in the middle.

**Activity 3** Measuring Circles (cont.)

3. When they have had a few minutes to work, have students share their conclusions and strategies. Is the point actually at the center of the circle? What did they do to find out?

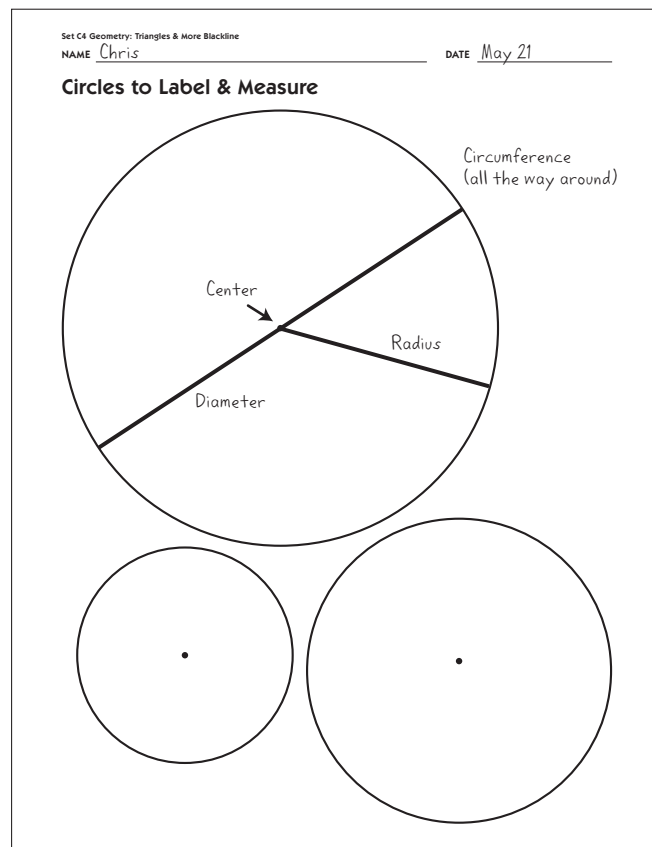
**Students** *We cut out the circle and folded it in half. The point landed right on the fold, so we said it must be the center.*

*We measured from the point to the edge of the circle. It was exactly an inch and a half on one side and then on the other side. That means the dot is right in the middle.*

*We kept measuring from the point to different places on the circle. It was an inch and a half every time. It must be in the center.*

4. Affirm students' experiments and explanations by explaining that a circle is a set of points that are all the same distance from the center. Give students each a copy of Circles to Label & Measure. Label the center of your circle as students label the center of the top circle on their sheets.

5. Reveal the other vocabulary words at the bottom of the overhead one by one. As you show each one, read and discuss the word and its definition with the class. Challenge students to use what they already know about points and line segments to figure out how to construct and label these dimensions on their top circle. Provide as much support as needed, but encourage them to think for themselves.



6. Have students use the inch side of their ruler to measure the radius and the diameter of the circle at the top of the page. Ask them to measure carefully to the nearest half-inch, and record the measurements on their sheets. How do the two measurements compare? Why?

### Activity 3 Measuring Circles (cont.)

**Students** *The diameter is 5 inches.*

*The radius is 2 and a half inches.*

*Two and a half is what you get if you cut 5 in half.*

*The radius has to be half the diameter! The diameter goes all the way across the circle. The radius only goes halfway.*

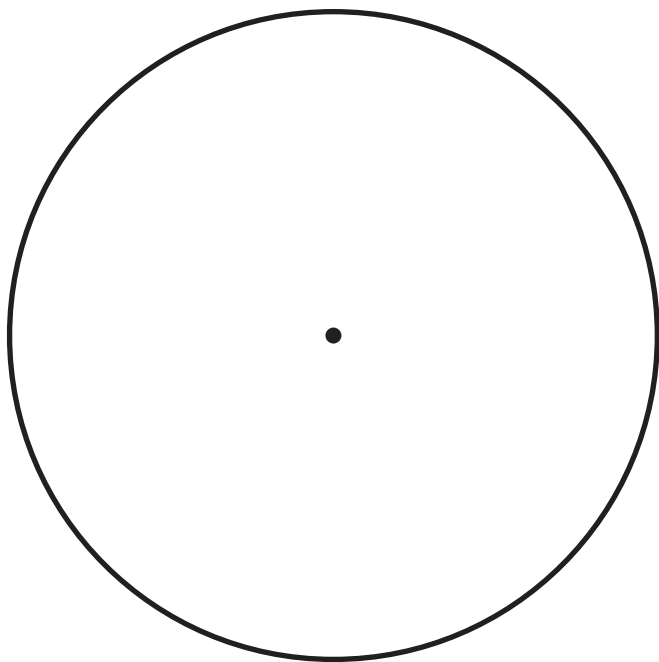
7. Ask students to test any theories they develop about the relationship between the radius and diameter of the circle by marking and measuring both dimensions on the other two circles on their sheets. Is the length of the radius always exactly half the length of the diameter?

#### Extension

Give each pair of students a 2-foot length of string. Have them use it to measure the circumference of each circle. Advise them to start with the largest circle on their sheet and work their way down to the smallest. That way, they can keep cutting the length of the string down, and won't need more than the original length. Ask them to record the circumference of each circle on the sheet, and then reflect on their results. What do they notice? (If you try this for yourself, you will see that the circumference is just a little more than 3 times the diameter of every circle. This is a good, hands-on demonstration of the formula for the circumference of a circle, which can be expressed as either  $\pi d$  or  $2\pi r$  where  $d$  is the diameter of the circle and  $r$  is the radius.

**Note** *The ratio of the circumference of a circle to its diameter is constant. That is, the ratio is the same no matter what size the circle is. This ratio is a bit more than 3, and is designated by the Greek letter  $\pi$ .*

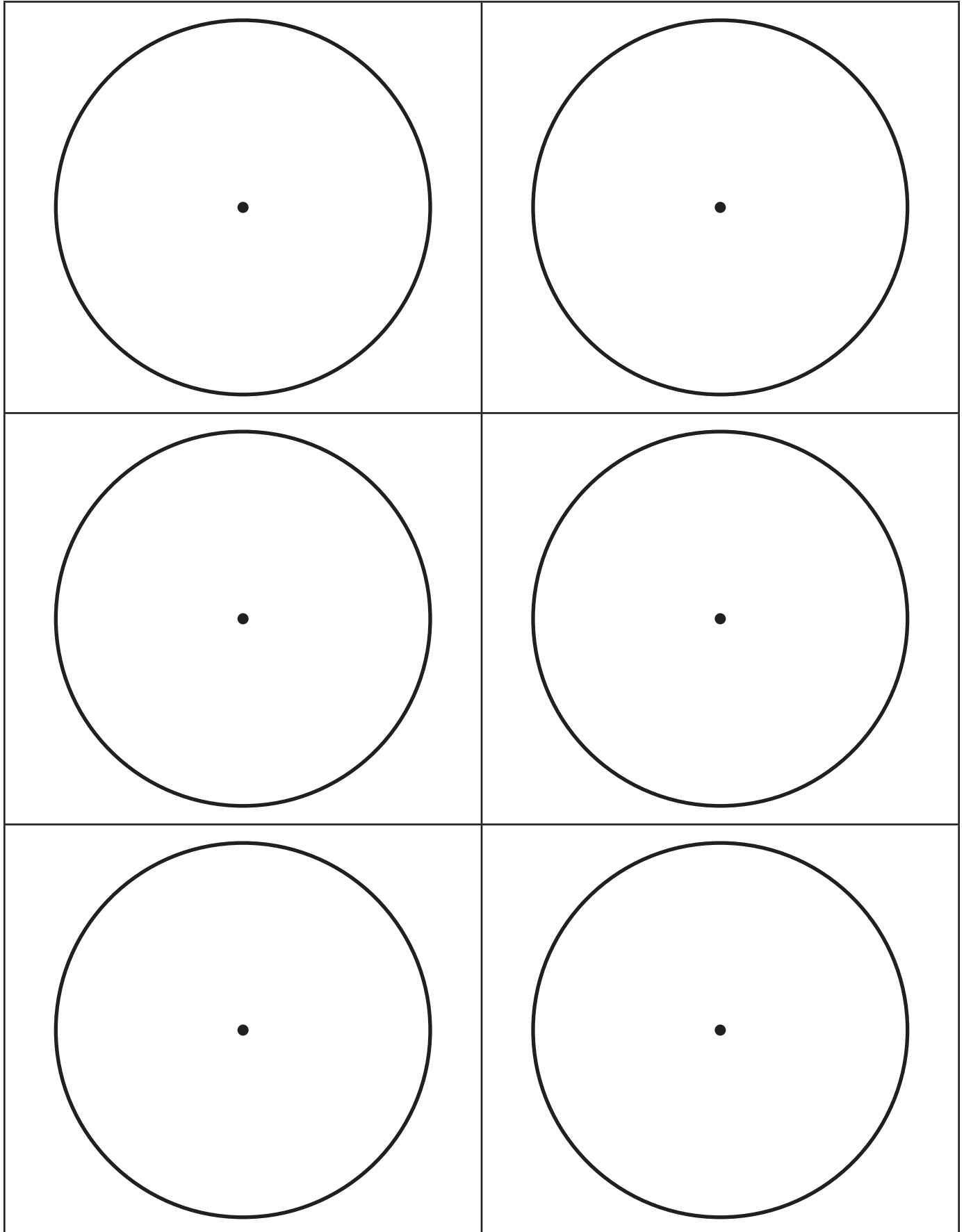
# A Circle



## Circle Words:

- Center—a point that is the same distance from all the points on a circle
- Radius—a line segment from the center of the circle to any point on the circle
- Diameter—a line segment that passes through the center of the circle and has endpoints on the circle
- Circumference—the distance around a circle

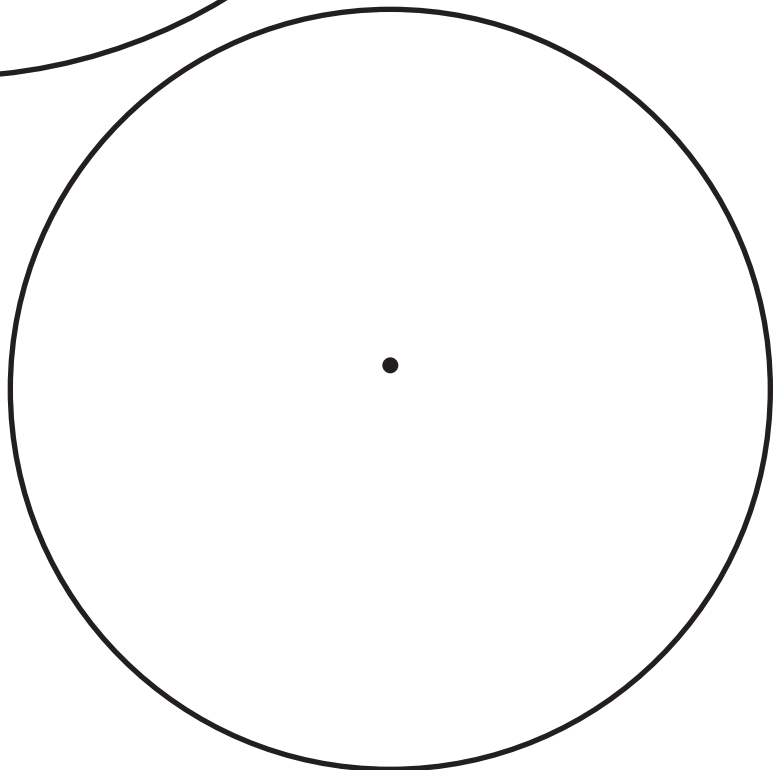
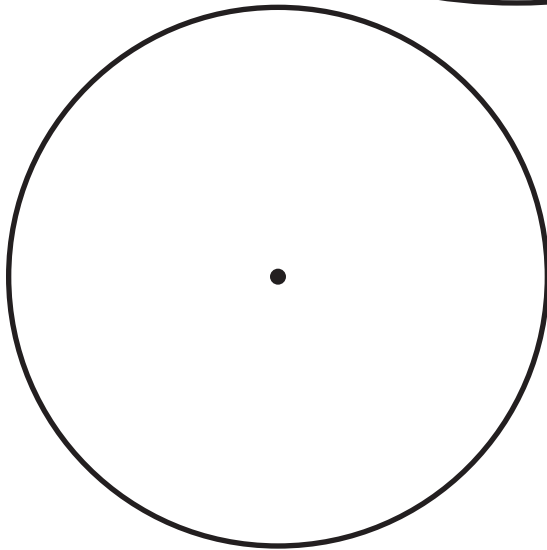
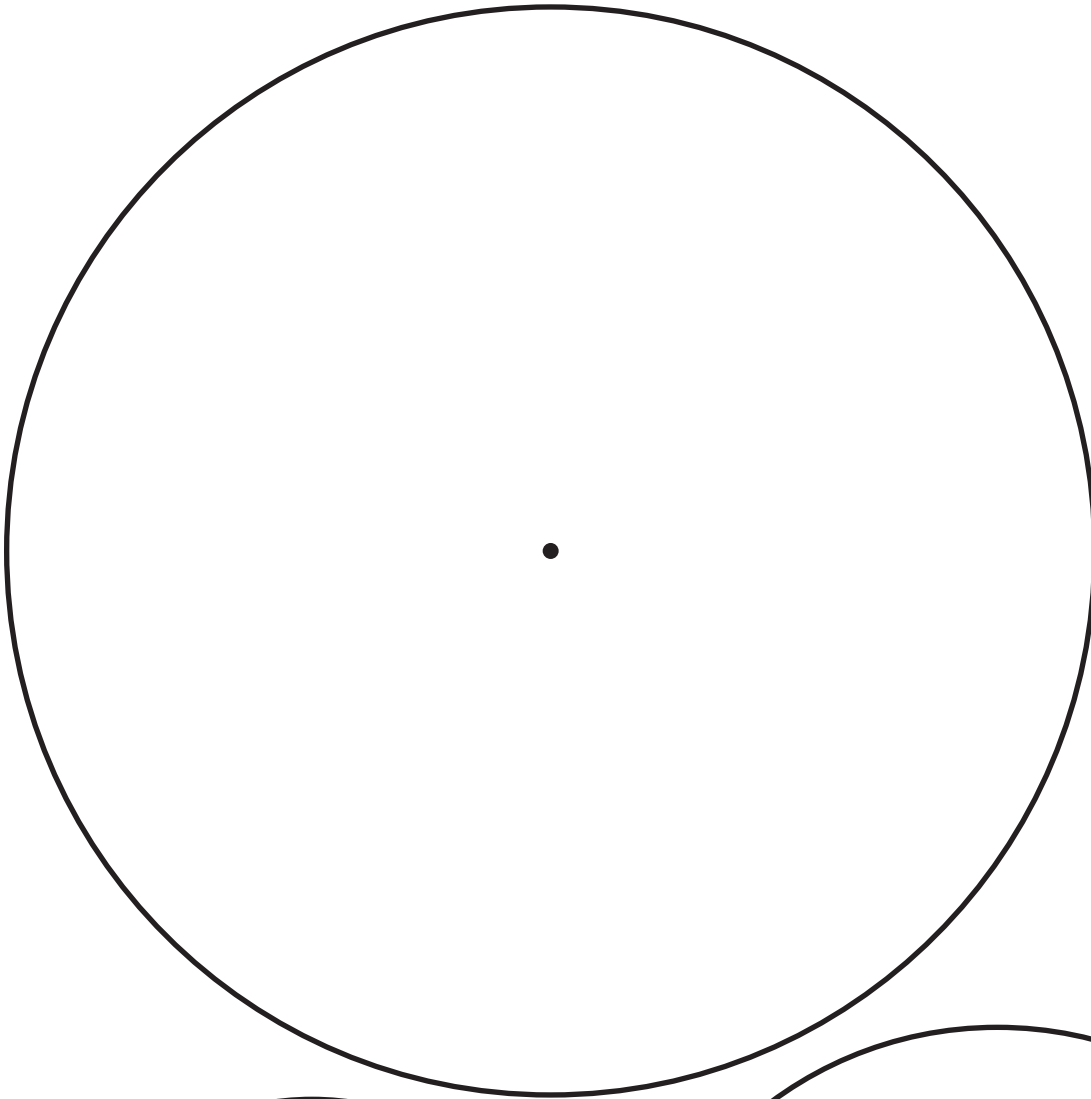
# Circles



NAME \_\_\_\_\_

DATE \_\_\_\_\_

# Circles to Label & Measure



NAME \_\_\_\_\_

DATE \_\_\_\_\_

# Set C4 ★ Independent Worksheet 1



## INDEPENDENT WORKSHEET

### Points, Lines, Line Segments, Rays & Angles

1 Use this drawing to answer questions 1a, b, and c.



a This is a drawing of a (circle one)

line

line segment

ray

angle

point

b What do the arrows on either end mean?

c The name of this figure is (circle one)

 $\overline{AB}$  $\overleftrightarrow{AB}$  $\vec{AB}$  $\angle AB$ 

2 Use your pencil, ruler, and Points C and D below. Draw line segment  $\overline{CD}$ .



C



D

a Why aren't there arrows at either end of your line segment?

b How long is  $\overline{CD}$ ? (Measure it to the nearest quarter inch.)

c What is the difference between a line segment and a line?

(Continued on back.)

**Independent Worksheet 1** Points, Lines, Line Segments, Rays & Angles (cont.)

**3** Use this drawing to answer questions 3a and b.



**a** This is a drawing of a (circle one)

- line      line segment      ray      angle      point

**b** The name of this figure is (circle one)

- $\overline{EF}$        $\overleftrightarrow{EF}$        $\overrightarrow{EF}$        $\angle EF$

**4** Use your pencil, ruler, and Points G, H, and I below.

- Draw ray GH.
- Draw ray GI



**a** The figure you just drew is a (circle one)

- line      line segment      ray      angle      point

**5** Look at points J, K, and L. If you make an angle by drawing ray KJ and ray KL, what kind of angle do you think you will get? (circle one)

- acute angle      right angle      obtuse angle



Try it. Were you right?

NAME \_\_\_\_\_

DATE \_\_\_\_\_

# Set C4 ★ Independent Worksheet 2

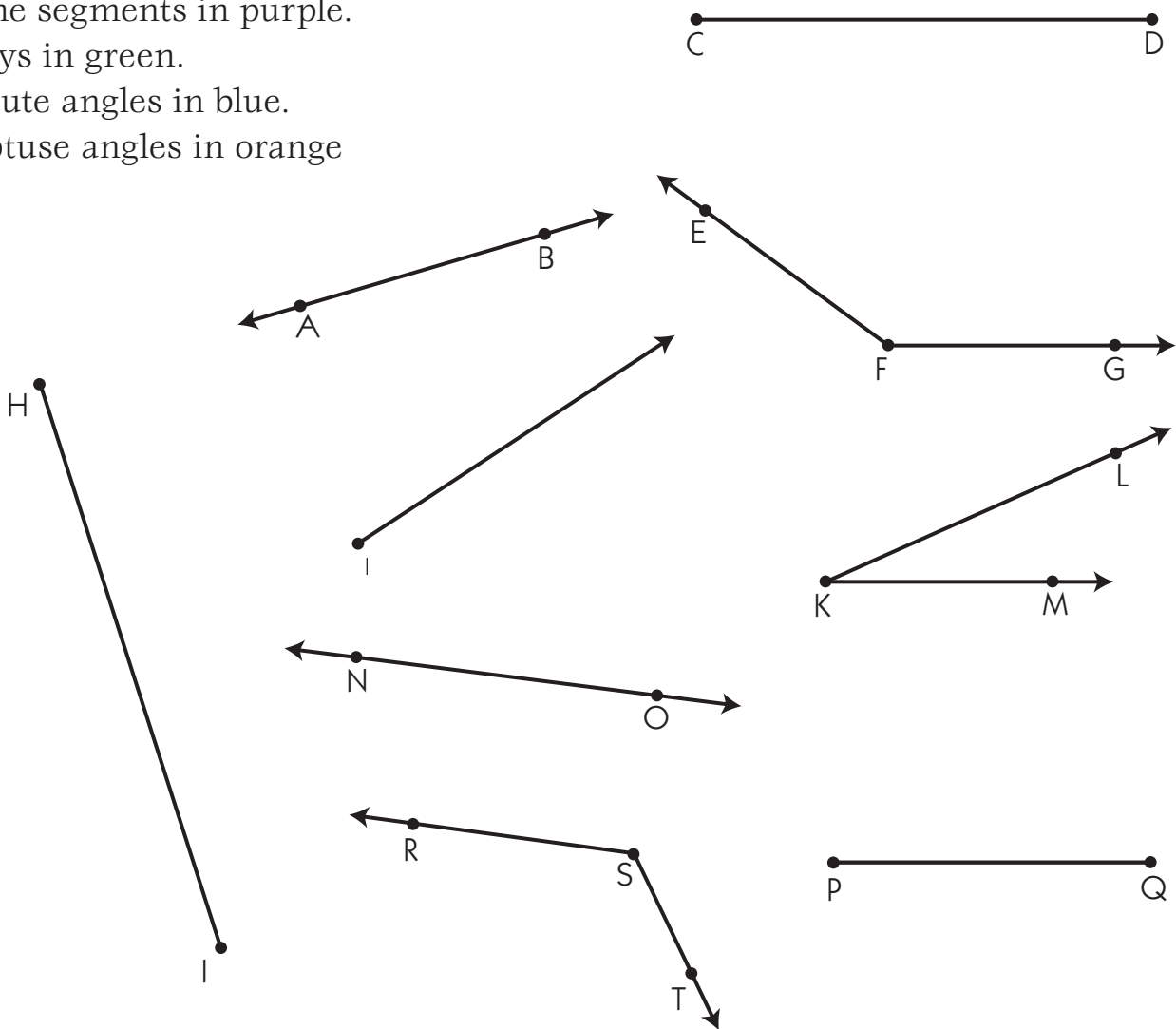


## INDEPENDENT WORKSHEET

### Geometry Find & Measure

1 Look at the figures on this page. Circle the

- lines in red.
- line segments in purple.
- rays in green.
- acute angles in blue.
- obtuse angles in orange



2 There are 3 line segments shown above. Measure each of them to the nearest quarter inch. Label each to show how long it is.



NAME \_\_\_\_\_

DATE \_\_\_\_\_

# Set C4 ★ Independent Worksheet 3

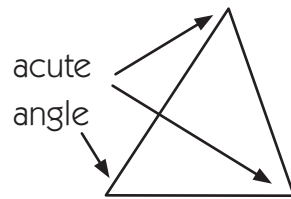


## INDEPENDENT WORKSHEET

### Name That Triangle!

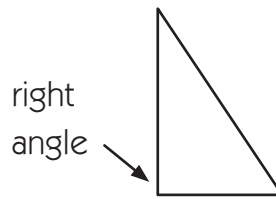
You can classify triangles by the size of their angles,

#### Acute Triangle



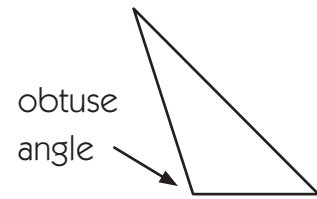
All 3 angles are acute.

#### Right Triangle



One of the angles is a right angle.

#### Obtuse Triangle

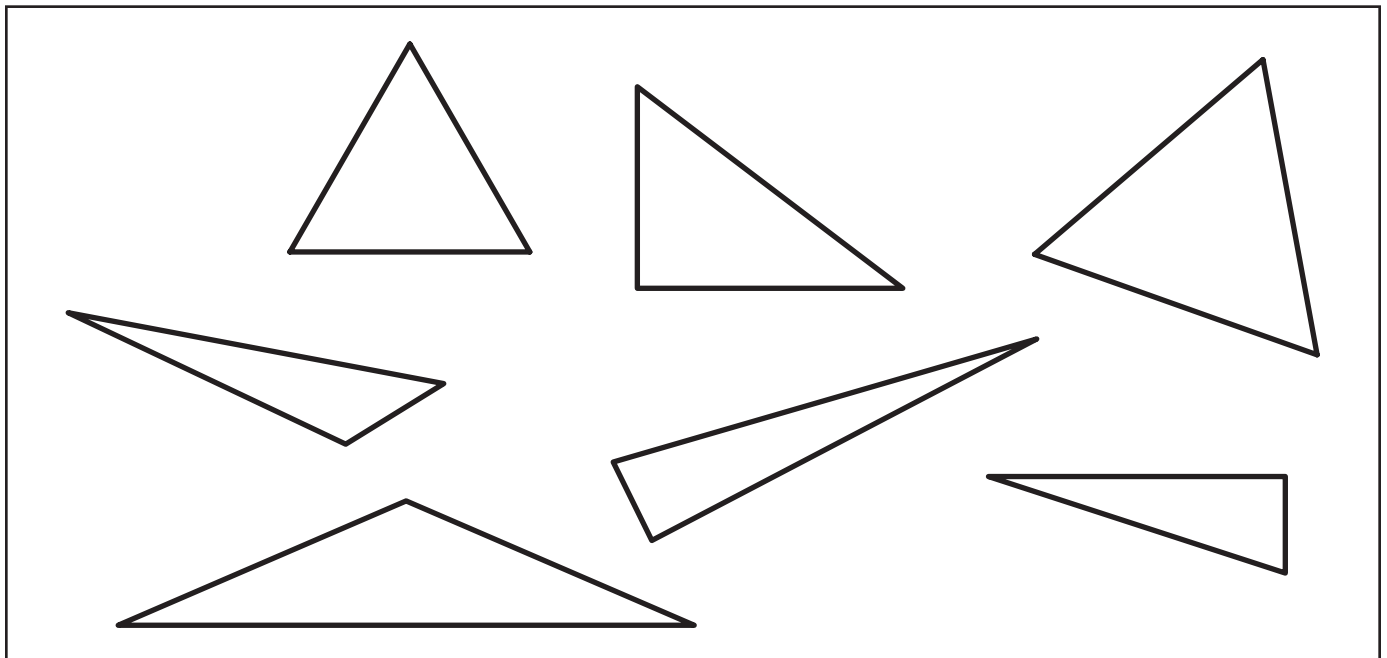


One of the angles is obtuse.

**1** Look at the triangles in the box below. Color:

- the acute triangles green.
- the right triangles red.
- the obtuse triangles orange.

**Hint** Use the corner of a piece of paper, a tile, or a square pattern block to help test the angles. Some of these triangles might fool you!

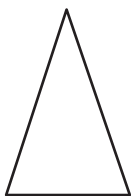


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### Independent Worksheet 3 Name That Triangle! (cont.)

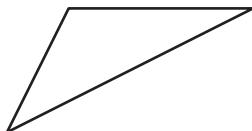
You can also classify triangles by the length of their sides.

#### Isosceles Triangle



Two sides are the same length.

#### Scalene Triangle



Each side is a different length.

#### Equilateral Triangle

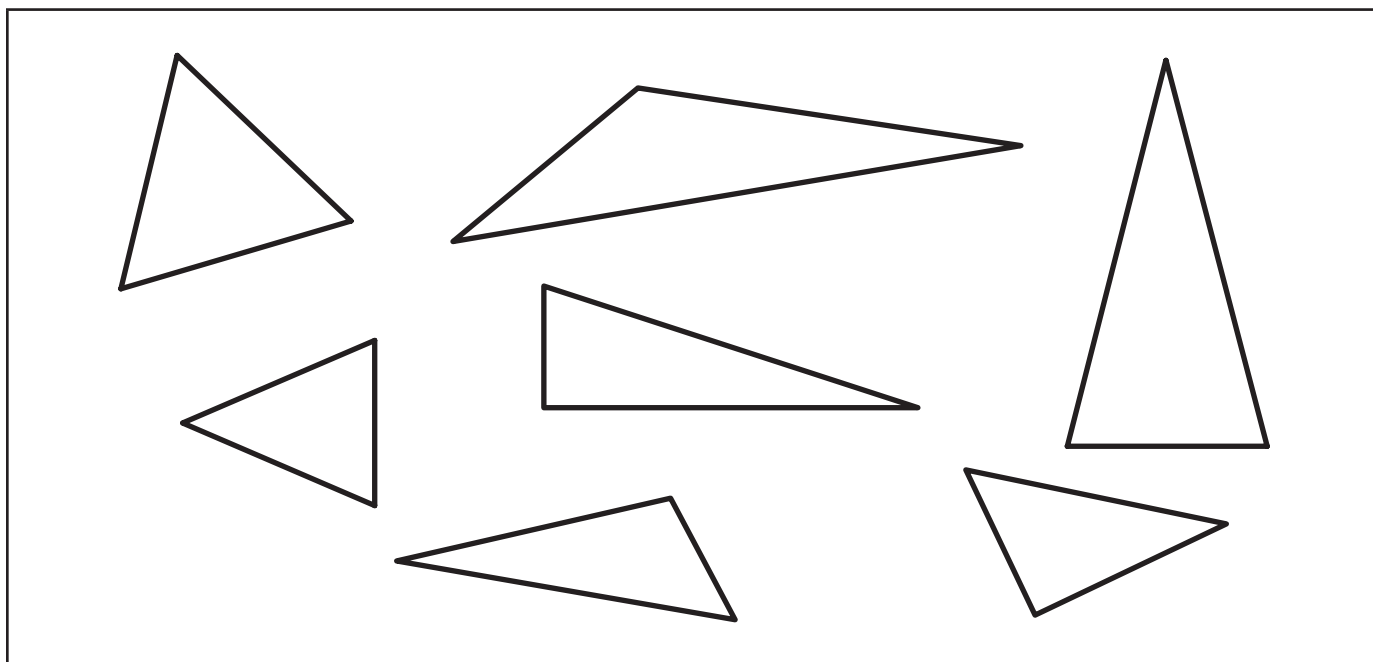


All 3 sides are the same length.

Look at the triangles in the box below. Color:

- the isosceles triangles purple.
- the scalene triangles yellow.
- the equilateral triangles blue.

**Hint** If you are not sure whether the side lengths are equal or not, use your ruler to help. Measure to the nearest quarter inch.



NAME \_\_\_\_\_

DATE \_\_\_\_\_

# Set C4 ★ Independent Worksheet 4



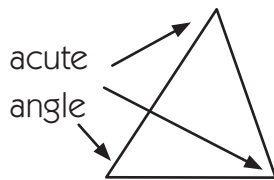
## INDEPENDENT WORKSHEET

### More Geoboard Triangles

Remember that you can classify and describe triangles in two different ways:

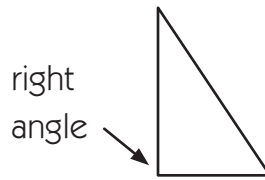
- by the size of their angles

#### Acute Triangle



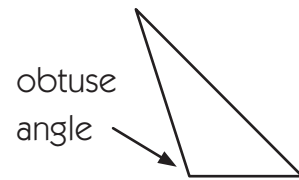
All 3 angles are acute.

#### Right Triangle



One of the angles is a right angle.

#### Obtuse Triangle



One of the angles is obtuse.

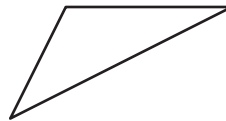
- by the length of their sides

#### Isosceles Triangle



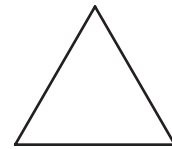
Two sides are the same length.

#### Scalene Triangle



Each side is a different length.

#### Equilateral Triangle

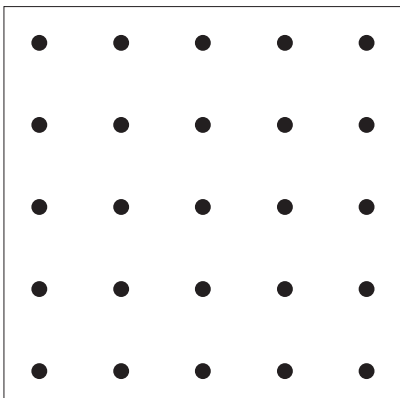


All 3 sides are the same length.

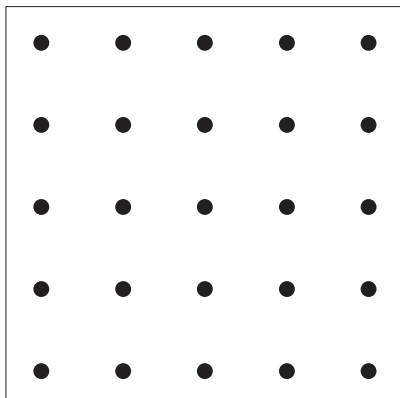
**1** Follow the instructions above each geoboard to draw some different triangles

*Hint* Build your triangles on a geoboard first. Then copy them onto the paper.

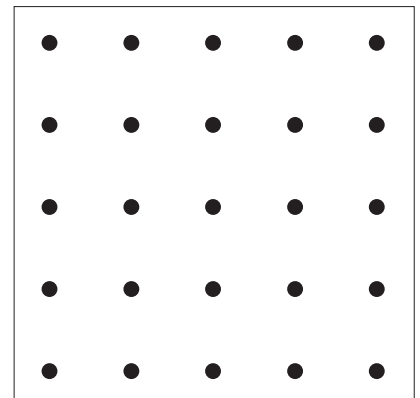
**a** A Right Triangle



**b** An Isosceles Triangle



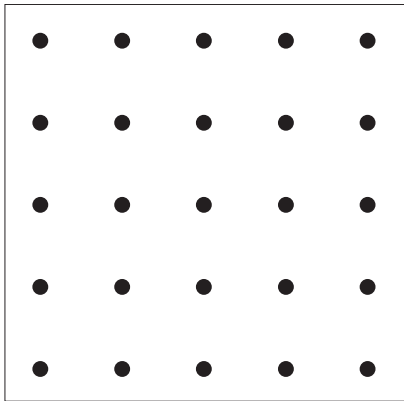
**c** An Acute Triangle



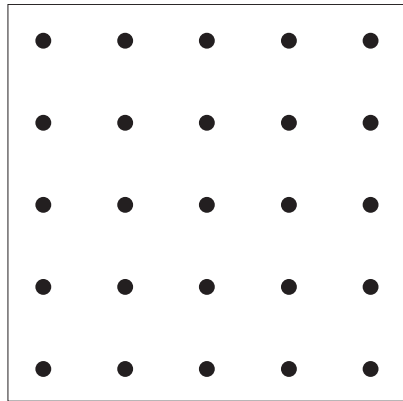
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**Independent Worksheet 4** More Geoboard Triangles (cont.)

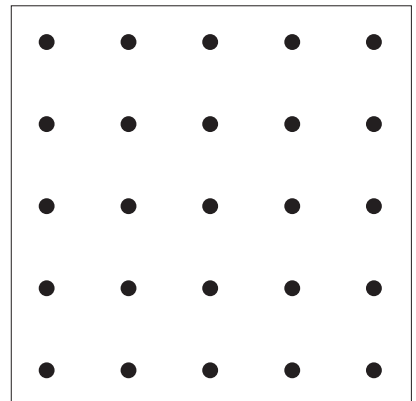
**d** An Obtuse Triangle



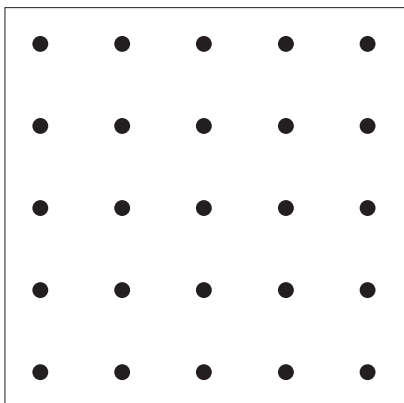
**e** A Scalene Triangle



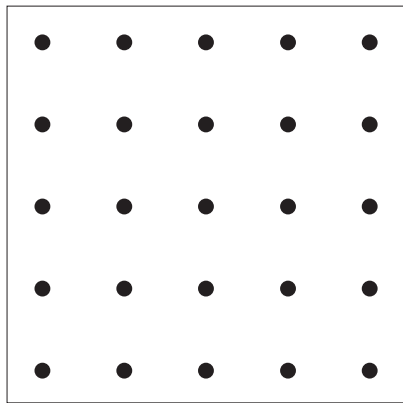
**f** A Right Triangle that is also Isosceles



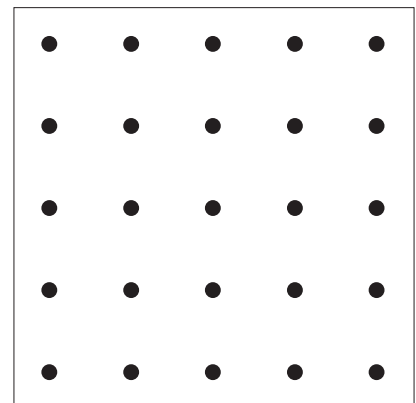
**g** A Right Triangle that is also Scalene



**h** An Acute Triangle that is also Scalene



**i** A Scalene Triangle that is also Obtuse



**CHALLENGE**

**2** Dana says it is impossible to draw a right triangle that is also acute. Do you agree with her? Why or why not? Use the geoboards below to test your ideas.

