



FigureThis!
Math Challenges for Families

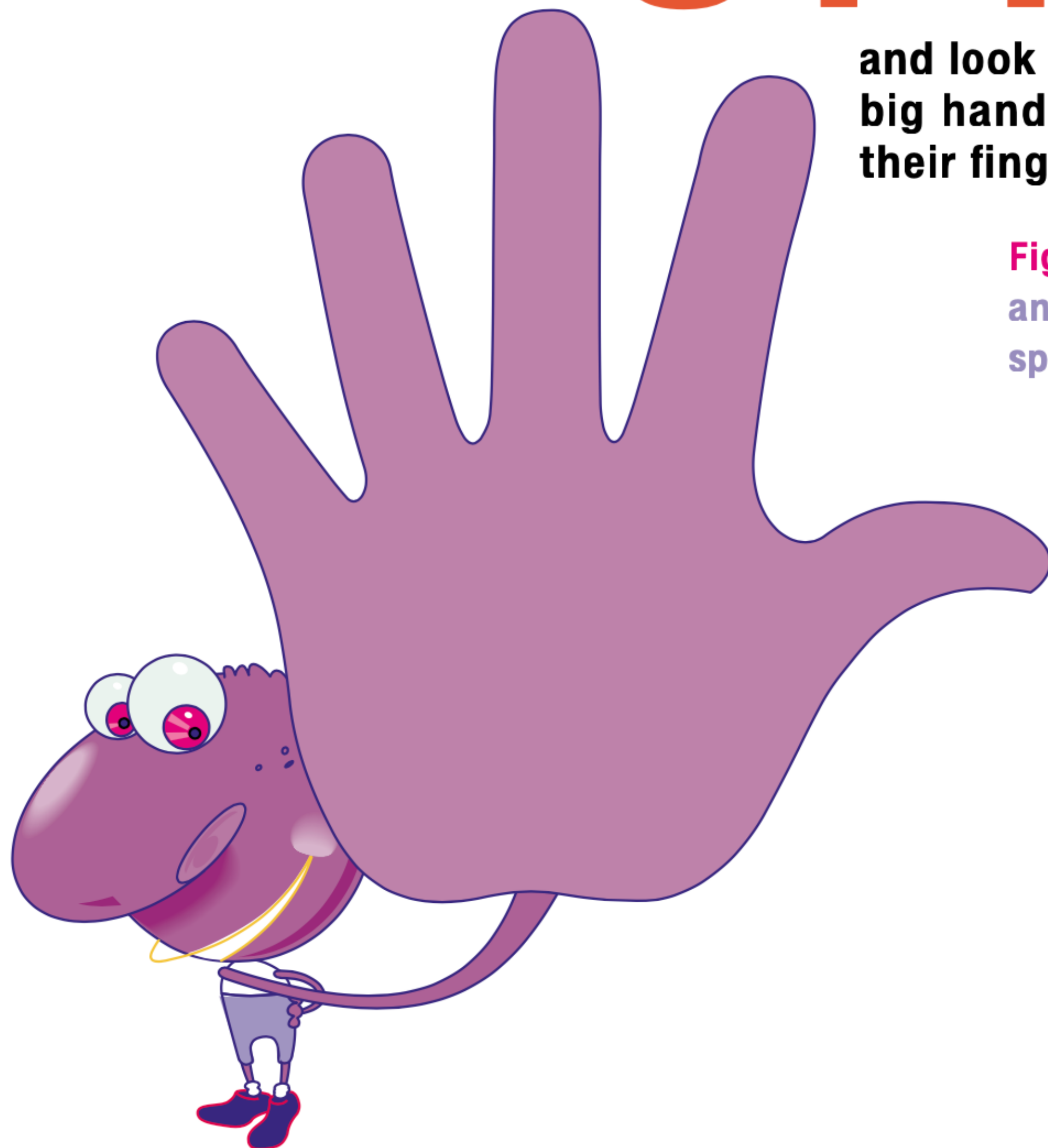
SPREAD

out your fingers
and look at your hand. Do people with big hands have larger angles between their fingers?

Figure This! Estimate the measures of the angles between your fingers when you spread out your hand.

Hint: When you hold your hand so that your thumb and index finger form an "L," the angle formed measures about 90° .

Angles are important geometric shapes. They are used in designing many things from airplanes to golf clubs.



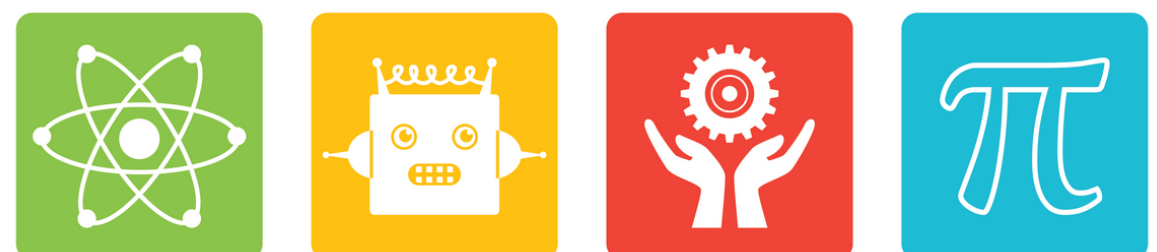
Competitive Kids STEM A Nonprofit Organization

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💡 The size of your hand does not make any difference in the size of the angles. The measures are approximately 90° , 45° , 20° , and 20° .



COMPETITIVE KIDS STEM PROJECTS

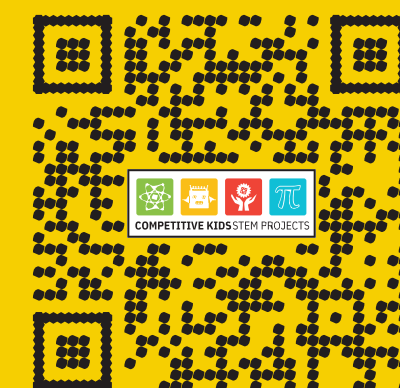


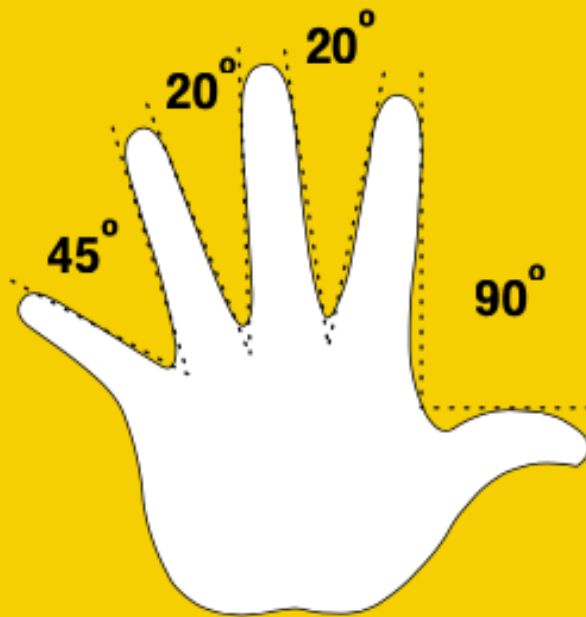
Figure This!

Get Started:

The angle measure between your thumb and index finger when your hand is shaped like an "L" is about 90° . How do the angle measures between your other fingers compare to this angle measure? Is the angle measure larger or smaller? Half as big? Draw the 90° angle between your thumb and index finger. Sketch an angle with half that measure. Use your sketch to estimate the measures of the other angles.

Complete Solution:

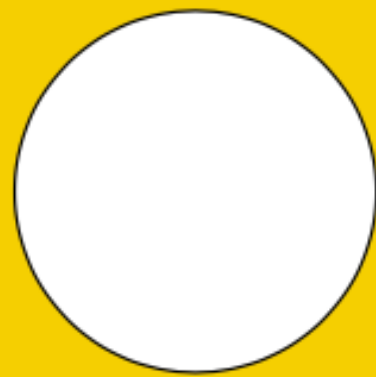
The largest angle, between the thumb and index finger, measures about 90° . (A 90° angle is a right angle.) The other angle measures vary somewhat depending on the person. One possibility is shown below:



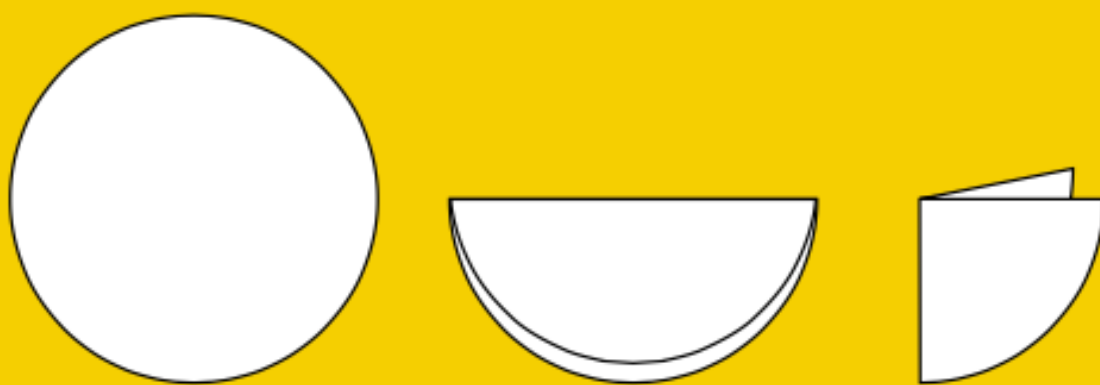
The lengths of the fingers do not affect the angle measures.

Try This:

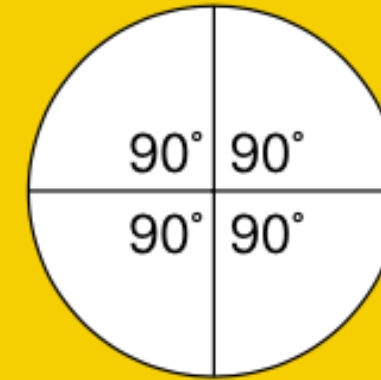
- Measure an angle by making your own angle measurer or protractor using the following steps.
1. Cut out a circular piece of waxed or other lightweight paper. (You may want to trace the bottom of a large cup.)



2. Fold the circle in half, and then fold the result in half.



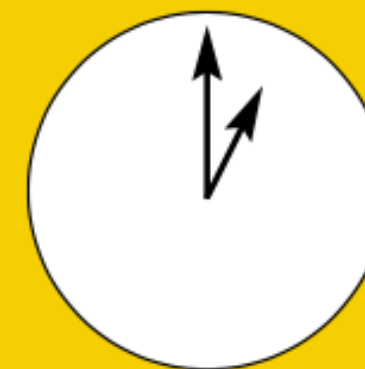
3. Unfold the paper and open the circle. You should see four right angles at the center of the circle. Each right angle has measure 90° .



4. Refold the circle on the same crease marks. Then fold the paper in half one more time. Unfold the paper to reveal eight angles, each of which measures 45° .
5. Refold the paper on the previous creases. Then fold in half one more time. How large is each new angle? Label each new angle with the appropriate measure.
6. To measure an angle with your protractor, place the center of the circle on the point of the angle and line up one of the creases with a side of the angle. Estimate the angle's measure by finding where the other side aligns on the protractor.

Additional Challenges:

1. Suppose a bicycle wheel turns around exactly once. This is a 360° revolution. How far would the bicycle wheel have moved on the ground?
2. On a compass, north has a heading of 0° . What is your heading when you are going east, south, or west?
3. What is the measure of the angle between the hands on a clock if one hand is on the number 12 and the other is on the number 1?



4. What do you think a negative angle might be?

Things to Think About:

- Why do you think Tiger Woods worries about the angle at which he hits a golf ball?
- What angles are important in designing a bicycle? Why?
- Many chairs recline or lean back. What kind of angles can you make in a reclining chair or in the driver's seat of a car?
- Angles are formed by tree branches and in the veins of a leaf. How big are these angles?
- What types of angles can you find on a cereal box?