Team Problems for Chapter 1

Name: __Solutions__

Date: _____

Problem #1: Find the Cell Phone

A cell phone tower at point A receives a cell phone signal from the southeast. A cell phone tower at point B receives a signal from the same cell phone from due west. Use the diagram below to find the location of the cell phone.


Describe how the postulates we learned in this section help you find the location of the cell phone.

> One of our postulates says that when two distinct lines intersect, they intersect at a single point.

Problem #2: Learning to Use a Ruler Part 1

Children sometimes try to measure the length of an object by placing one end of the object at the 1 marking instead of the 0 marking, as shown in the centimeter ruler in the figure.
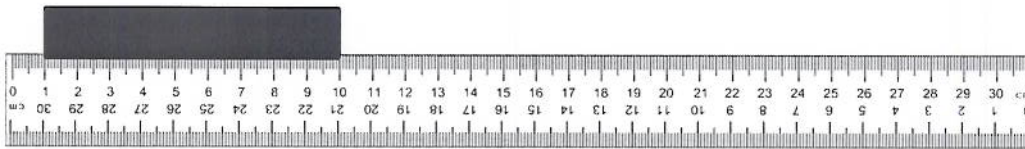
a. How might you help a child understand that the strip below is not 10 cm long, even though the end of the strip is at 10?

> We could stack 9 1-cm cubes along the strip to measure it.

b. Why might a child put one end of the strip at the 1 marking?

> Because we start counting at 1!

c. Can you measure by starting at 1 or another tick mark?

> Sure! We could count 1-cm lengths from 1 to 10 (9 of them = 9 cm)
>
> or we could find the distance is 10 cm − 1 cm = 9 cm.

Problem #3: Learning to Use a Ruler Part 2

a. When asked how long the dark strip in the next figure is, some children will report that it is 13 cm long. Others will respond that it is 12 cm long. How do you think children come up with these answers?
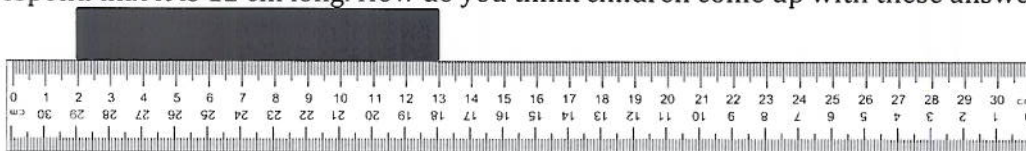
13 cm: This student is reading the right endpoint

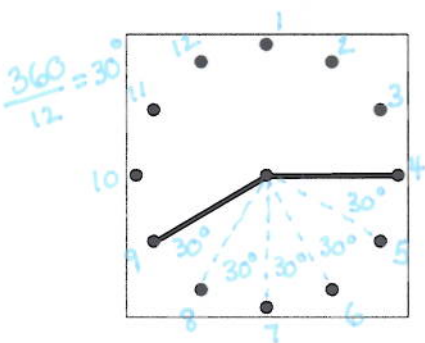12 cm: This student is counting the tick marks underneath the strip.

b. Some students might report that the strip measured by the inch ruler shown is 3.5 inches long. Why is this not correct? What is a correct way to report the length of the strip?

This student gave the answer 3.5 because the strip is 5 tick marks longer than 3 inches. But since there are 16 of these small tick marks between 3 & 4, the strip is really $3\frac{5}{16}$ inches long.
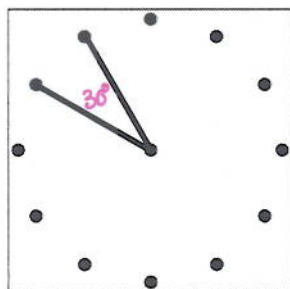
Problem #4: Angles on the Clock

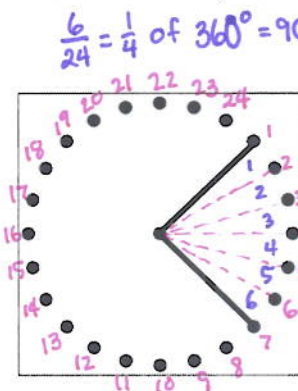Find the measure of the following angles **without using a protractor**. Classify each as acute, right, or obtuse.
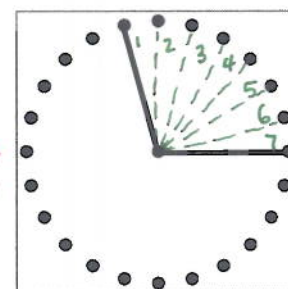
$\frac{360}{12} = 30°$

$\frac{6}{24} = \frac{1}{4}$ of $360° = 90°$

$\frac{360}{24} = 15°$

$15° \times 7 = 105°$

Measure: 150°   30°   90°   105°

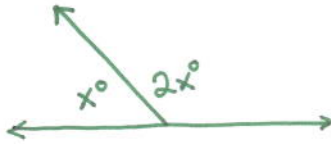Classify: obtuse   acute   right   obtuse

Problem #5: Angle Pairs and their Relationships

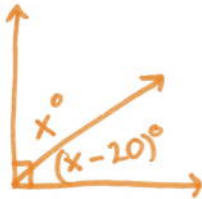Find the measure of each angle in the angle pair described. Start by drawing a diagram.

a. The measure of one angle is twice the measure of its supplement.

$$x + 2x = 180°$$
$$3x = 180$$
$$x = 60$$

Angles measure $\boxed{60°, 120°}$

b. The measure of one angle is 20 less than the measure of its complement.

$$x + x - 20 = 90$$
$$2x - 20 = 90$$
$$2x = 110$$
$$x = 55$$

$\boxed{55°, 35°}$

Problem #6: Treasure Hunting

The treasure map for this exercise shows a cactus and a tree marking two spots in a desert location. The treasure is described as buried under a spot that is 30 feet from the cactus and 50 feet from the tree. Use this information (and a ruler and compass!) to help you show where the treasure might be buried.

10 feet
1 cm

3cm = 30ft
5cm = 50ft
3cm = 30ft
5 cm = 50ft
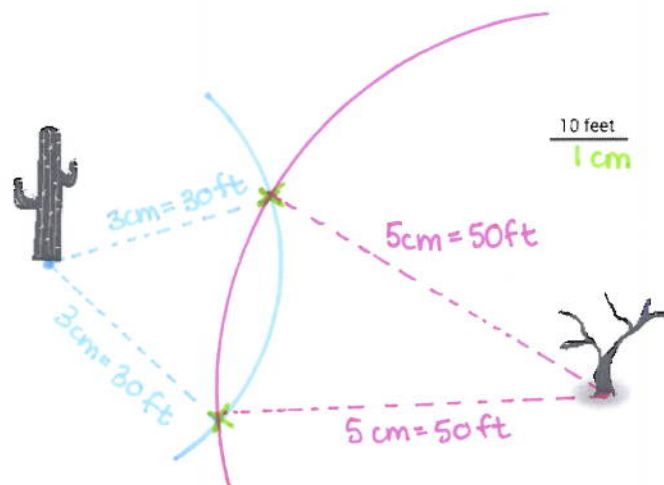
Is the information enough to tell you *exactly* where the treasure is buried? Explain.

No, but it narrows your options down to 2 locations!