1 Solving Angle Problems

Problem 1. Find all of the unknown angles in the following diagram:
Problem 2. Find all of the unknown angles in the following diagram:
2 What is a circle?

Problem 3. A teacher asks her students for a precise definition of the term circle.

1. Sarah says “A circle is a round segment with no endpoints”. Name at least two things wrong with Sarah’s definition.

2. Michael says “A circle is 360°”. What two notions is Michael confusing?

3. Write down a precise definition of the term circle. (Try to do this without looking in your textbook!)

3 A puzzle box

Problem 4. Several “GPS puzzle boxes” have been constructed in the last few years. These consist of a locked box that will only open if it is taken to the correct location somewhere on Earth (often requiring a journey of hundreds of miles for the recipient). In other words, the target location is the “key” for the lock. One setup for these boxes is as follows:

1. There is a screen and a button on the top of the box.

2. Every time you press the button, the screen displays your current distance from the target location and indicates the number of button presses remaining.

3. After the button is pressed 50 times, the box is permanently locked.

Can you come up with a strategy to solve this puzzle? In other words, how would you determine the target location in order to open the box? What is the minimum number of button presses required to guarantee a solution to this puzzle?

(Hint: Ask yourself how this might be related to the geometric ideas introduced in section 2.1.)
4 Definitions

Study the following definitions from Section 2.2 of your textbook before the next class:

1. Triangle (Make sure you understand the distinction between the “2nd-grade” definition and the “adult” definition)
2. Picture proof
3. Interior angle
4. Exterior angle

You should also preview the following angle properties:

1. $\angle \text{ sum of } \Delta.$
2. $\angle \text{ sum of rt. } \Delta.$
3. Ext. $\angle \text{ of } \Delta.$