

Practice Test 1  
February XX, 2006

**Name:**

No calculators allowed. You will need a compass and a straightedge.

DO NOT BEGIN TEST UNTIL INSTRUCTED TO  
DO SO.

Write out and sign the honor code below.

I will be academically honest in all of my academic work and will  
not tolerate academic dishonesty of others.

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- (1) What are two ways of defining (or thinking about) the concept of *angle*? Briefly describe how these are related.

- (2) Donna got in her car facing eastward at point  $A$  and drove to point  $B$  along the route indicated in Figure 1.

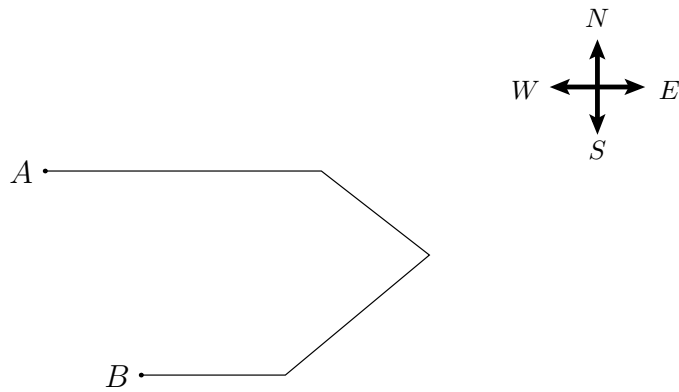


FIGURE 1. Donna's Route

- (a) Show all of Donna's angles of turning along her route.  
 (b) What is the *total* amount of turning that Donna did along her route? Describe how you can determine this *without* measuring the individual angles and adding them up.

- (c) How does this example use two ways of thinking about the concept of *angles*?

- (3) The towns of Dearborn and Flint are 10 miles apart. A new S-Mart is being planned exactly 7 miles from Dearborn and 5 miles from Flint. Indicate on the map in Figure 2 where the S-Mart could be located. Explain your answer and how the definition of a circle is involved.

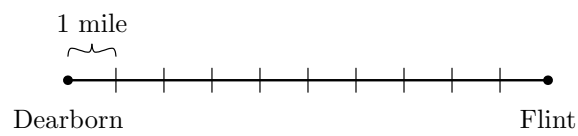


FIGURE 2. A Map of Dearborn and Flint. Where Could S-Mart be Located?

- (4) Explain why the sum of the angles in a triangle must always be  $180^\circ$ .

- (5) (a) Use a compass and a straightedge to divide the angle  $BAC$  in Figure 3 in half.

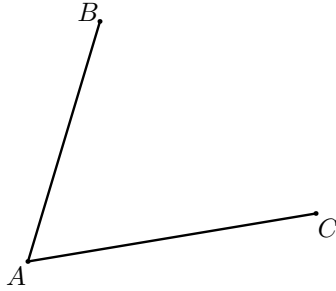


FIGURE 3. Bisect the Angle  $BAC$

- (b) Show a rhombus that arises naturally from your construction in part (a). Use the definition of rhombus to explain why your shape really is a rhombus.
- (c) Which properties of rhombuses are related to your construction in part (a)? Explain.

(6) Visualize a prism with a pentagon base. How many faces does this prism have? What shapes are the faces? Explain.

(7) (a) What kinds of triangles have reflection symmetry? Explain.

(b) What kinds of triangles have rotation symmetry? Explain.