

# MEASUREMENT AND ERROR

NAME \_\_\_\_\_

SECTION \_\_\_\_\_



1. Bridges on the Kansas State Turnpike have the distance from the beginning of the turnpike to the bridge printed on the side of the bridge. The bridge in the picture has a mileage of 110.820 (miles) printed on the south (maybe the west) side of an overpass bridge crossing on the turnpike. The distance printed on the opposite side of the overpass bridge is also 110.820 miles. Assuming the Kansas Department of Transportation (KDOT) uses a global positioning system device accurate to within  $\pm 1.5$  meters:
  - a. Express the error in measuring accuracy of the GPS device used by KDOT in + or - terms in units of feet (show your work).
  
  
  
  
  
  
  
  
  
  
  - b. Express the error in measuring accuracy of the GPS device used by KDOT in + or - terms in units of miles (show your work).

- c. Is the mileage number written on the bridge overpass reported to a reasonable number of significant figures? Explain.
  
2. Consider that the width of a four-lane overpass is 18 meters. Is it reasonable to report the distance as the same number (110.820 miles) on opposite sides of this overpass? Explain.
  
3. Would it be reasonable to use “111 miles” as the distance measure on both sides of the overpass? Explain.
  
4. What number should be reported if the same number is to be printed on both sides of the overpass? Explain.