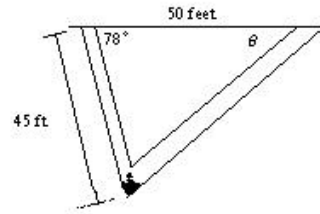


Law of Sines and Cosines to the Rescue!

Name \_\_\_\_\_

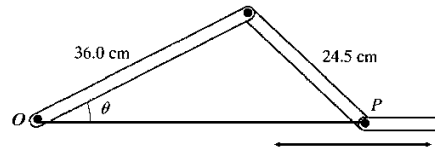
Row \_\_\_\_\_

1. A child is trapped 45 feet down from an abandoned mine shaft that slants at an angle of  $78^\circ$  from the horizontal. (See figure.)



- a. At what angle should the tunnel be dug? \_\_\_\_\_
- b. If the tunnel can be dug at a rate of 3 ft/hr how many hours will it take to rescue the child? \_\_\_\_\_

2. The point  $P$  on the mechanism shown is driven back and forth horizontally.



- a. If the minimum value of angle  $q$  is  $32.0^\circ$ , find the maximum distance  $OP$ .
- b. What is the maximum value of angle  $q$ ?
- c. What is the distance between extreme positions of  $P$ ?