

# Problems of the Month

## March 2017

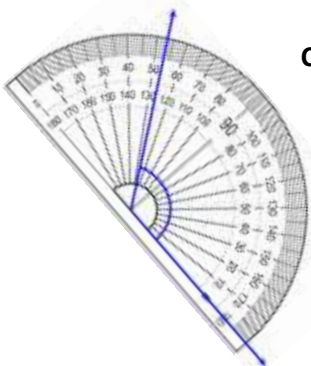
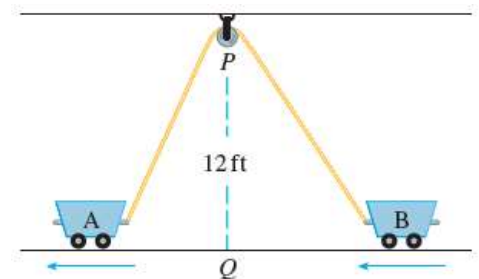
### General Problem:

Alice is going to spend her Spring Break on the oceanfront. The ocean is 600 miles from where she lives. Her car gets 32 miles per gallon, and gas costs \$2.50 per gallon. How much money is it going to cost Alice to travel to and from the ocean for Spring Break?



### Calculus Problem:

Two carts, A and B, are connected by a rope 39 feet long that passes over a pulley P. The point Q is on the floor 12 feet directly beneath P and between the carts. Cart A is being pulled away from Q at a speed of 2 feet per second. How fast is cart B moving toward Q at the instant when A is 5 feet from Q?



### Challenge Problem:

Let an angle  $\theta$  be given. Find an equation for all points  $P = (x, y)$  where  $y > 0$  such that  $\angle APB = \theta$  for the points  $A = (-1, 0)$  and  $B = (1, 0)$ .