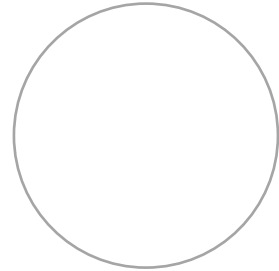


Section 3-7 Sinusoidal Functions as Mathematical Models

Waterwheel Problem:

Suppose that a waterwheel with radius of 7 feet rotates at 6 revolutions per minute (rpm). 2 seconds after you start a stopwatch, point P on the rim of the wheel is at its greatest height, $d = 13$ ft, above the surface of the water. The center of the waterwheel is 6 ft above the surface.



a) Sketch the graph of d as a function of t , in seconds, since you started the stopwatch.

b) Write an equation of the sinusoid.

c) How high above or below the water's surface will P be at time $t = 17.5$ sec?

d) At what time t was point P first emerging from the water?