

4A

What if the acceleration is not constant? A particle starts from the origin with velocity $5\hat{i}$ m/s at $t = 0$ and moves in the xy plane with a varying acceleration given by $\vec{a} = (6\sqrt{t}\hat{j})$ m/s², where t is in s. (a) Determine the vector velocity of the particle as a function of time. (b) Determine the position of the particle as a function of time.

4B

Figure P4.27 represents the total acceleration of a particle moving clockwise in a circle of radius 2.50 m at a certain instant of time. At this instant, find (a) the radial acceleration, (b) the speed of the particle, and (c) its tangential acceleration.

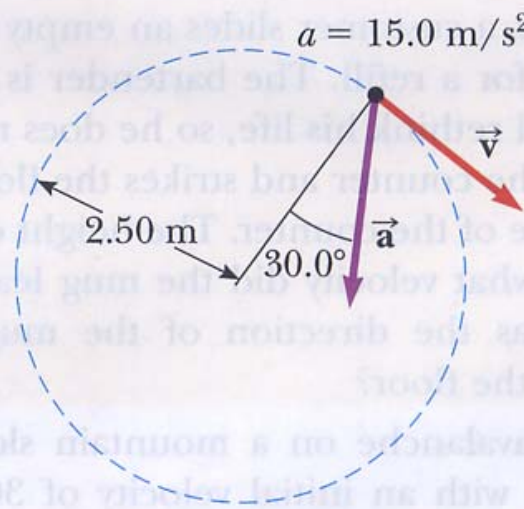


Figure P4.27

4C

A river has a steady speed of 0.500 m/s. A student swims upstream a distance of 1.00 km and swims back to the starting point. If the student can swim at a speed of 1.20 m/s in still water, how long does the trip take? Compare this answer with the time interval required for the trip if the water were still.