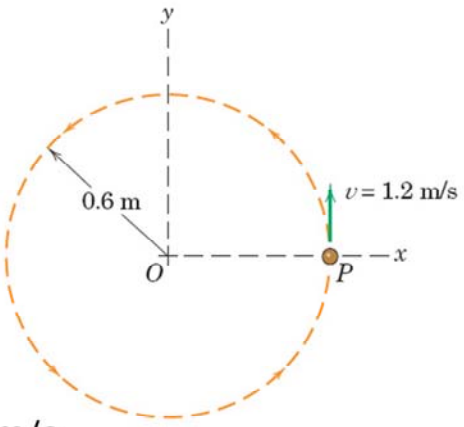
Circular Motion: Exercise



Particle *P* moves in a circular path shown.

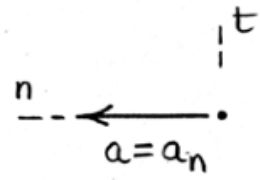
Determine the magnitude of ***acceleration*** for:

(a) constant ***velocity*** 1.2 m/s
(b) ***velocity*** 1.2 m/s and increasing 2.4 m/s each second
(c) ***velocity*** 1.2 m/s and decreasing 4.8 m/s each second

2/106 (a) $a_n = \frac{v^2}{\rho} = \frac{1.2^2}{0.6} = 2.4 \text{ m/s}^2$

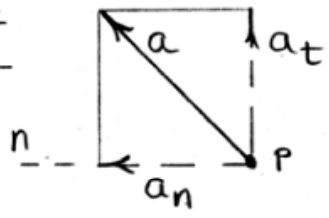
$a_t = 0$

$a = \sqrt{a_n^2 + a_t^2} = \underline{2.4 \text{ m/s}^2}$



(b) $a_n = 2.4 \text{ m/s}^2$, $a_t = 2.4 \text{ m/s}^2$

$a = \sqrt{2.4^2 + 2.4^2} = \underline{3.39 \text{ m/s}^2}$



(c) $a_n = 2.4 \text{ m/s}^2$, $a_t = -4.8 \text{ m/s}^2$

$a = \sqrt{2.4^2 + 4.8^2} = \underline{5.37 \text{ m/s}^2}$