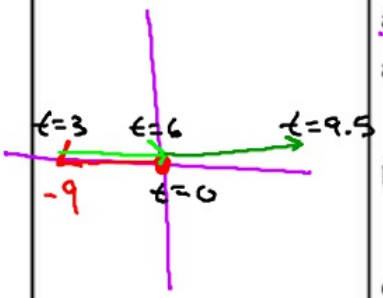
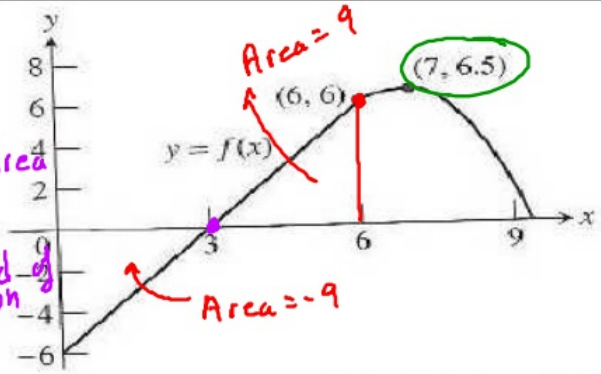
Page 15

$s = \int_0^x f(t)\,dt$ → Area

$v = f(x)$ → y-coord of graph

$a = f'(x)$ → slope




y = f(x) is the differentiable function whose graph is shown in the figure. The position at time t (seconds) of the particle moving along a coordinate axis is $s = \int_0^x f(t)\,dt$

a) What is the particle's velocity at time t = 3? $v(3) = 0$

b) Is the acceleration of the particle at time t = 3 positive or negative?

$a(3) > 0$

c) What is the particle's position at time t = 3? $s(3) = \int_0^3 f(t)\,dt = \frac{1}{2}(3)(-6)$

d) When does the particle pass through the origin?

$t = 6$

e) Approximately when is the acceleration 0? $t = 7$

f) When is the particle moving toward the origin? $t = 3$ to $t = 6$

g) When is the particle moving away from the origin?

$t = 0$ to $3$ $\quad t = 6$ to $9.5$

h) On which side of the origin does the particle lie at time t = 9?

Right