BC CALCULUS PRACTICE 6.7 **Name:** _____ **Period** _____

Aisle: _____ 6.7: pg. 416 – 5, 9b, 11b, 13, 17, 19, 25b, 39

5. A particle moves along the s-axis. Use the given information to find the position function fo the particle. (a) $v(t) = 3t^2 - 2t; s(0) = 1$ (b) $a(t) = 3\sin 3t; v(0) = 3; s(0) = 3$	A particle moves with a velocity of $v(t)$ m/s along an s-axis. Find the displacement and the distance traveled by the particle during the given time interval. 9. (b) $v(t) = \cos t;\ \pi/2 \le t \le 2\pi$ 11. (b) $v(t) = \sqrt{t} - 2;\ 0 \le t \le 3$
13. a particle moves with acceleration $a(t)$ m/s^2 along an s-axis and has velocity of v_0 m/s at time $t = 0$. Find the displacement and the distance traveled by the particle during the given time interval. $a(t) = 3; v_0 = -1; 0 \le t \le 2$	17. In each part use the given information to find the position, velocity, speed, and acceleration at time $t = 1$. (a) $v = \sin \frac{1}{2}\pi t;\ s = 0$ when $t = 0$ (b) $a = -3t;\ s = 1$ and $v = 0$ when $t = 0$

19. Suppose that a particle moves along a line so that its velocity v at time t is given by

$$v(t) = \begin{cases} 5t, & 0 \le t < 1 \\ 6\sqrt{t} - \dfrac{1}{t}, & 1 \le t \end{cases}$$

where t is in seconds and v is in centimeters per second (cm/s). Estimate the time(s) at which the particle is 4 cm from its starting position.

25b. For the given velocity function $v(t)$, use a CAS to find the displacement.

$$v(t) = 0.5 - te^{-t}; 0 \le t \le 5$$

In Exercises 39–48, assume that a free-fall model applies. Solve these exercises by applying Formulas (12) and (13) or, if appropriate, use those from Exercise 30 with $a = -g$. In these exercises take $g = 32\ \text{ft/s}^2$ or $g = 9.8\ \text{m/s}^2$, depending on the units.

39.

A projectile is fired vertically upward from ground level with an initial velocity of 16 ft/s.

(a) How long will it take for the projectile to hit the ground?

(b) How long will the projectile be moving upward?