Name: _____ Math 211 Quiz 8

Section: 322 ☐ 323 ☐ Nov 15, 2012

1. (15 pts) Find the general indefinite integral.

a. $\int (3\sqrt{t} + \frac{1}{2\sqrt{t}})dt$ **b.** $\int 4e^{-2x}dx$ **c.** $\int \frac{2+3y}{4y}dy$

a. $\int 3t^{1/2} + \frac{1}{2}t^{-1/2}\,dt$

$= 3\frac{t^{3/2}}{3/2} + \frac{1}{2}\frac{t^{1/2}}{1/2} + C$

$= \boxed{2t^{3/2} + t^{1/2} + C}$

b. $= 4\frac{e^{-2x}}{-2} + C$

$= \boxed{-2e^{-2x} + C}$

c. $\int \frac{1}{2}\frac{1}{y} + \frac{3}{4}\,dy$

$= \boxed{\frac{1}{2}\ln|y| + \frac{3}{4}y + C}$

2. (5 pts) An object is moving along a straight path that runs north and south. Its velocity, in feet per minute, is given by

$$v(t) = 18 - 8t + 0.3t^2$$

where the north is the positive direction. After ten minutes, is the object north of its starting position, or south? *Hint: compute the net change of position.*

$$\int_0^{10} v(t)\,dt = \int_0^{10} 18 - 8t + 0.3t^2\,dt$$

$$= \left[18t - 4t^2 + 0.1t^3\right]_0^{10}$$

$$= 180 - 400 + 100$$

$$= \boxed{-120}$$

Since $-120 < 0$, the object will be south of its starting position.