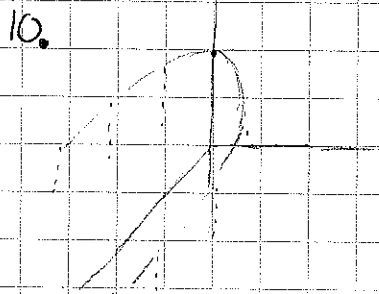
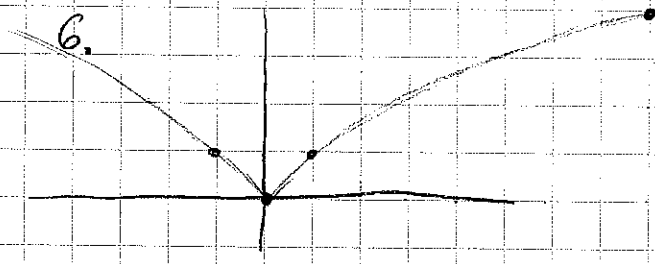
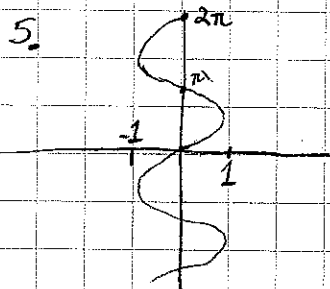


Answers to recitation work sheet 2/8

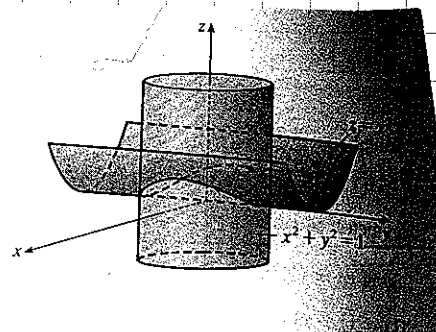
A. $\vec{F}(t) = \langle 3e^{3t}, 2t \cdot \tan(t) + t^2 \sec(t), \frac{1}{2\sqrt{t}} \rangle$

B. $\vec{F}'(t) = \left\langle \frac{1 \cdot (t^2+1) - 2t \cdot t}{(t^2+1)^2}, \frac{1}{t^2+4}, 0 \right\rangle$

C. $\vec{F}'(t) = \left\langle -\frac{1}{t^2}, 2te^{t^2}, \ln(t)+1 \right\rangle$



24. $z = x^2$
 $\sin^2 t = (\sin t)^2 \checkmark$
 $x^2 + y^2 = 1$
 $(\sin t)^2 + (\cos t)^2 = 1 \checkmark$



25. $(2t - t^2) = (t)^2 + (0)^2$
 $0 = 2t^2 - 2t$
 $= 2t(t-1)$
 $\Rightarrow t=0 \text{ or } t=1$

28. $x = 2 \sin t$
 $y = 2 \cos t$
 $z = 4 \sin t \cdot \cos t$ \rightarrow always choose sin & cos for cylinders

30. $x = t$ — choose $x = t$ to make things easier
 $y = t^2$
 $z = 4t^2 + t^4$

59. $\left[\sin^3(t) \hat{i} - \cos^3(t) \hat{j} + \sin^2(t) \hat{k} \right]_0^{\pi/2}$
 $= (1^3 - 0 + 1^2) - (0 - 1^3 + 0) = 1$

60. $r(t) = \langle t^2 + c_1, t^3 + c_2, \frac{2}{3}t^{3/2} + c_3 \rangle$

$$1^2 + c_1 = 1 \quad 1^3 + c_2 = 1 \quad \frac{2}{3}1^{3/2} + c_3 = 0$$

$$c_1 = -1 \quad c_2 = 0 \quad c_3 = -\frac{2}{3}$$

$$r(t) = \langle t^2 - 1, t^3, \frac{2}{3}t^{3/2} - \frac{2}{3} \rangle$$