

MATH 102 #8 SOLUTIONS

1. EVALUATE $f(-x) = (-x)^3 e^{(-x)^2}$

$$= -x^3 e^{x^2}$$

$$= -f(x) \Rightarrow \text{IT IS ODD}$$

2. FIND EQUATIONS FIRST:

CIRCLE: $(x^2) + (y-1)^2 = 1$

LINE: $y = \frac{1}{2}x + 1$

INTERSECT $\rightarrow$ INSERT y FROM LINE INTO CIRCLE:

$$x^2 + \left(\frac{1}{2}x + 1 - 1\right)^2 = 1$$

$$\frac{5}{4}x^2 = 1 \Rightarrow x = \pm \sqrt{\frac{4}{5}} \left(\approx \pm .894 \right)$$

THE GRAPHS INTERSECT AT x -COORDINATES $\pm \sqrt{\frac{4}{5}}$.

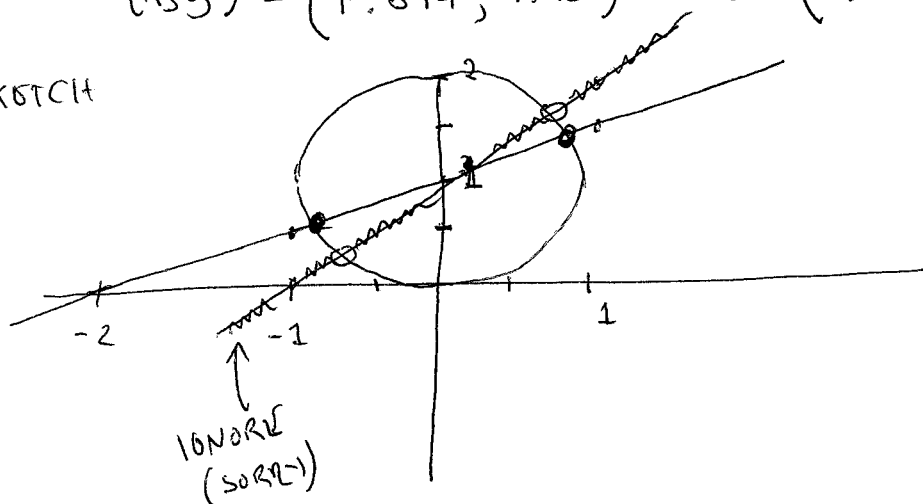
TO FIND y -COORDINATES, INSERT INTO $y = \frac{1}{2}x + 1$

$$\Rightarrow y = \pm \sqrt{\frac{1}{5}} + 1$$

INTERSECT AT ABOUT

$$(x, y) = (+.894, 1.45) \text{ AND } (-.894, .553)$$

SKETCH



#8 CONTINUED

$$3 a) \quad 2 e^{2t-5} = 15$$

$$e^{2t-5} = \frac{15}{2}$$

$$2t-5 = \ln\left(\frac{15}{2}\right)$$

$$2t = \ln\left(\frac{15}{2}\right) + 5$$

$$t = \frac{1}{2} \left(\ln\left(\frac{15}{2}\right) + 5 \right) \approx 3.51$$

$$b) \quad \ln(3x+1) - \ln(x) = 1$$

$$\ln\left(\frac{3x+1}{x}\right) = 1$$

$$\frac{3x+1}{x} = e$$

$$3x+1 = ex$$

$$1 = (e-3)x$$

$$x = \frac{1}{e-3} \approx -3.55$$