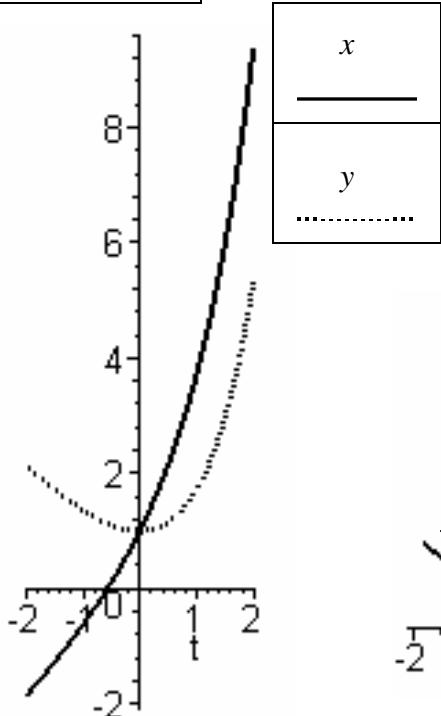
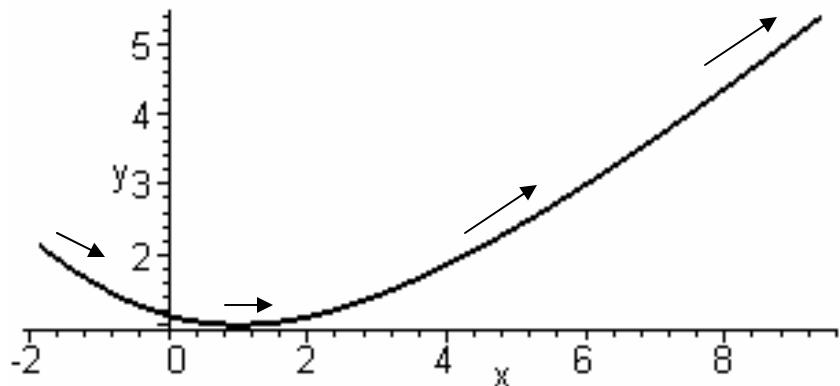


4)  $x = e^{-t} + t \quad y = e^t - t \quad -2 \leq t \leq 2$

Regular Plot

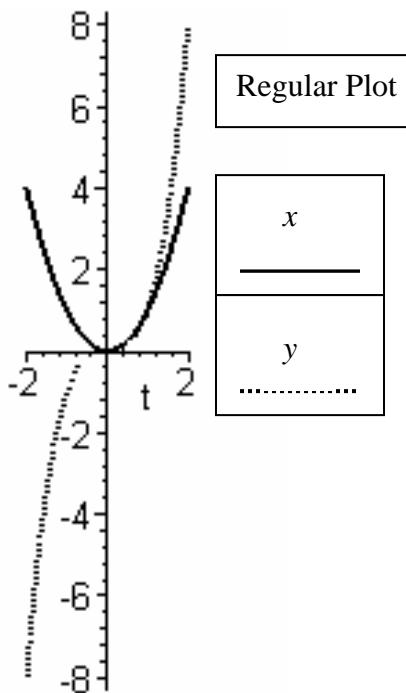


Parametric Plot



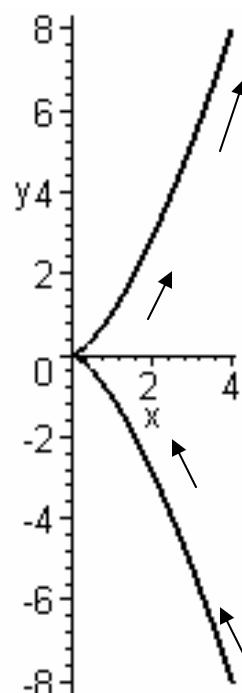
8)  $x = t^2 \quad y = t^3$

Part a)



Regular Plot

Parametric Plot



Part b) Since we need a function where domain is  $(-\infty, \infty)$ , we need to set up  $x$  as a function of  $y$ .

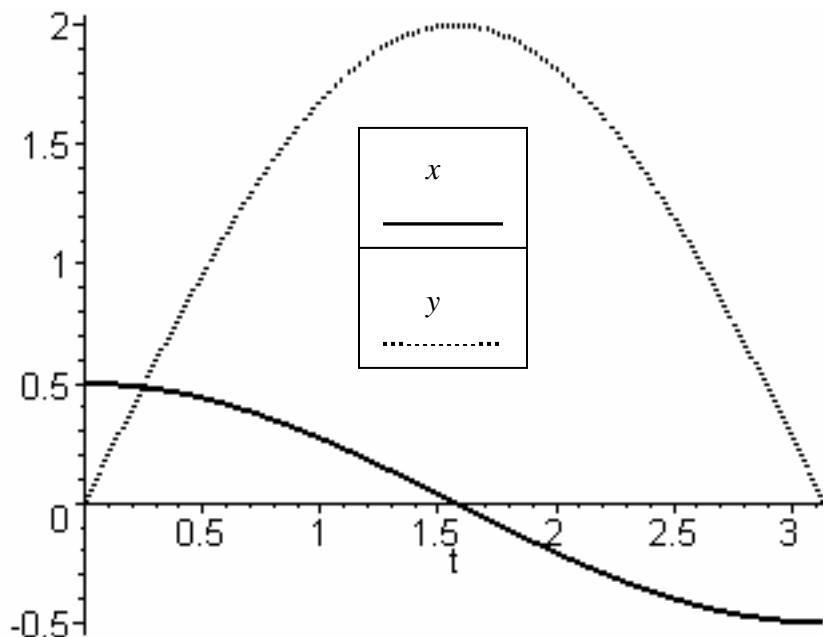
$$t = \sqrt[3]{y} \Rightarrow x = (\sqrt[3]{y})^2 = y^{\frac{2}{3}}$$

10)  $x = \frac{1}{2} \cos \theta \quad y = 2 \sin \theta \quad 0 \leq \theta \leq \pi$

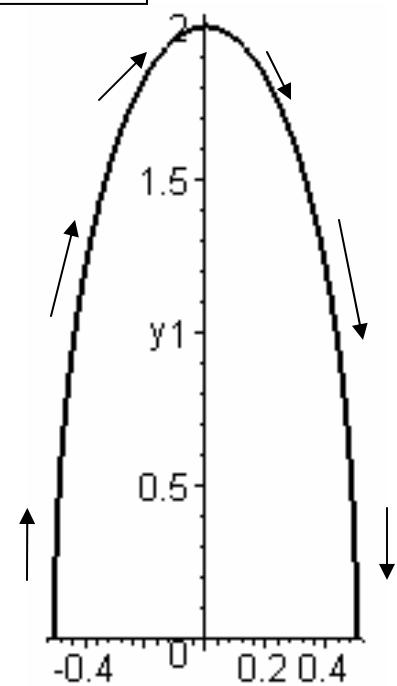
Part a)  $x = \frac{1}{2} \cos(0) = \frac{1}{2}$     $x = \frac{1}{2} \cos(\pi) = -\frac{1}{2}$     $2x = \cos \theta$     $\theta = \cos^{-1}(2x)$     $y = 2 \sin(\cos^{-1}(2x)) \quad -\frac{1}{2} \leq x \leq \frac{1}{2}$

Part b)

Regular Plot



Parametric Plot

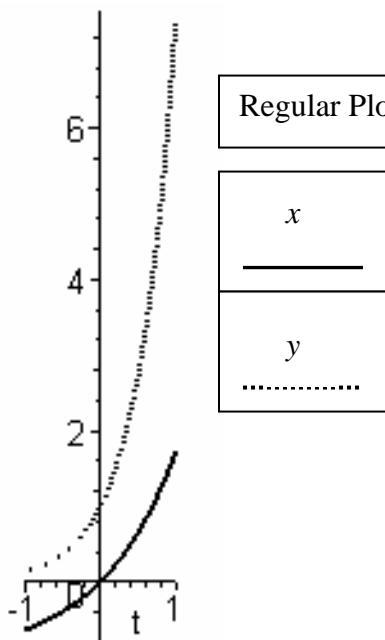


12)  $x = e^t - 1 \quad y = e^t$

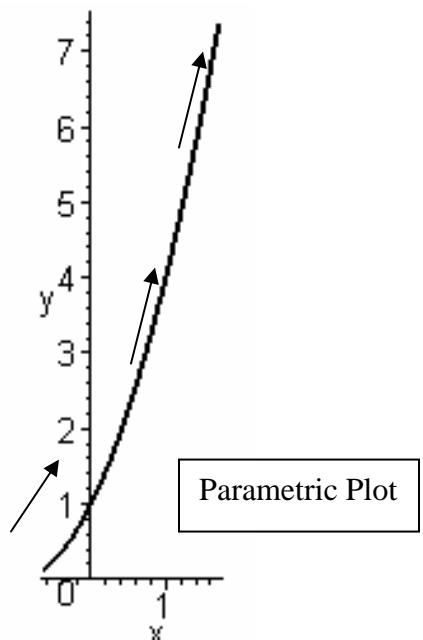
Part a)  $x + 1 = e^t \Rightarrow \ln(x+1) = t \Rightarrow y = e^{2 \ln(x+1)} = e^{\ln(x+1)^2} = (x+1)^2$

Part b)

Regular Plot



Parametric Plot

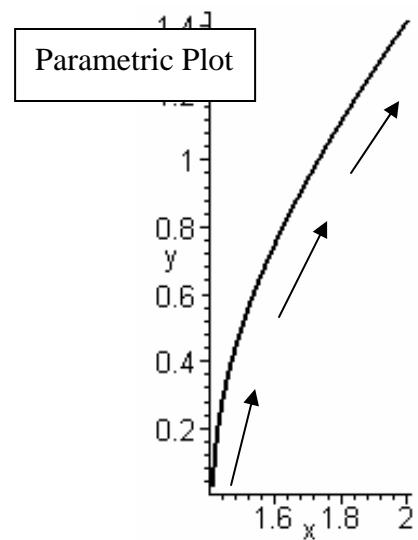
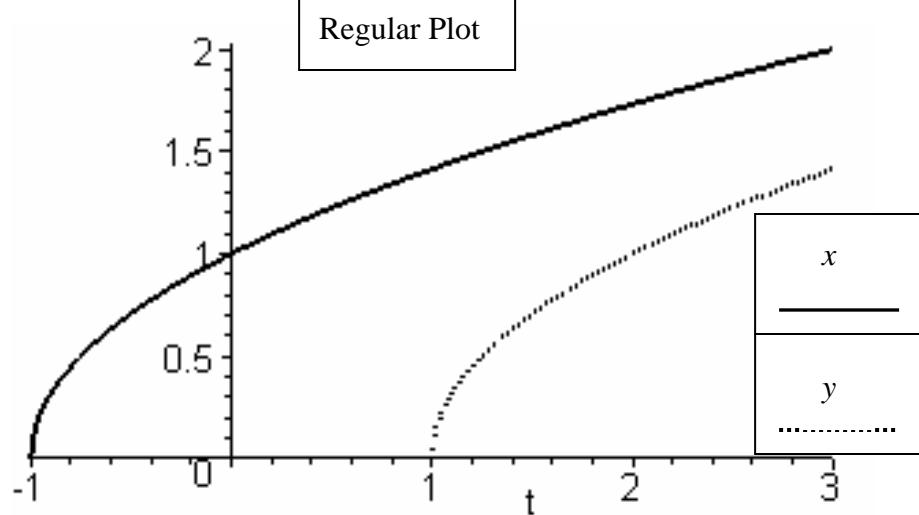


14) There is an error in this question, it should be  $x = \sqrt{t+1}$   $y = \sqrt{t-1}$

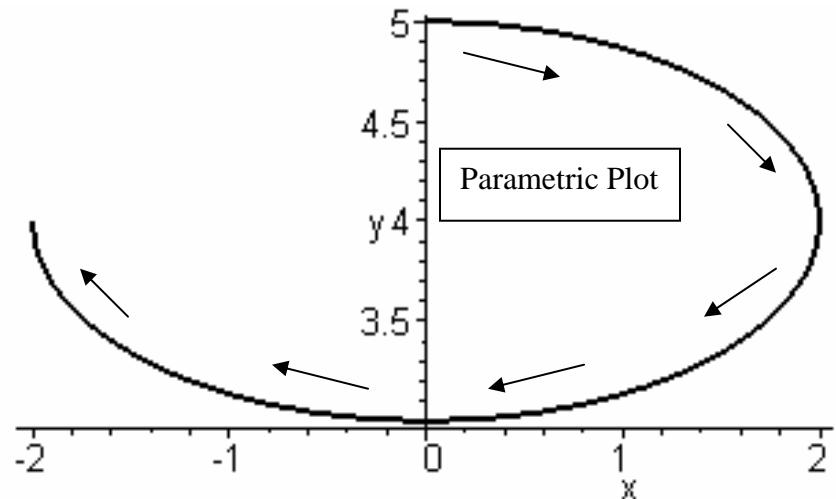
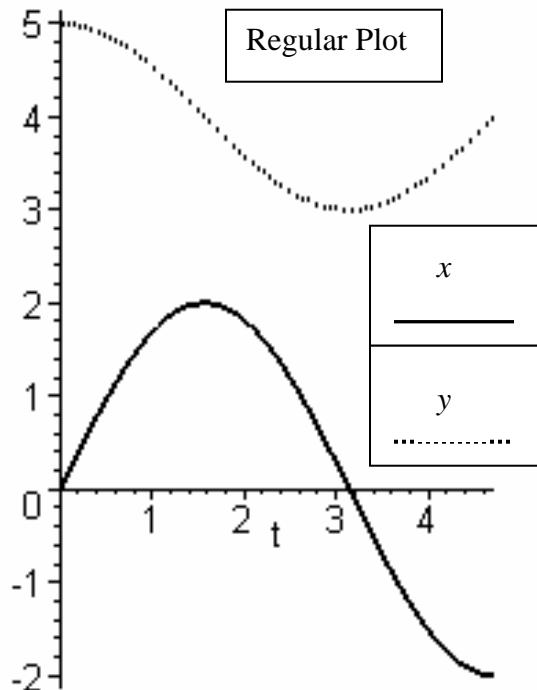
$$\text{Part a)} \quad x^2 = t+1 \Rightarrow x^2 - 1 = t \Rightarrow y = \sqrt{(x^2 - 1) - 1} = \sqrt{x^2 - 2}$$

Since the domain of  $x = \sqrt{t+1}$   $y = \sqrt{t-1}$  is  $[1, \infty)$ , the domain for the  $y = \sqrt{x^2 - 2}$  is  $[\sqrt{2}, \infty)$ .

Part b)

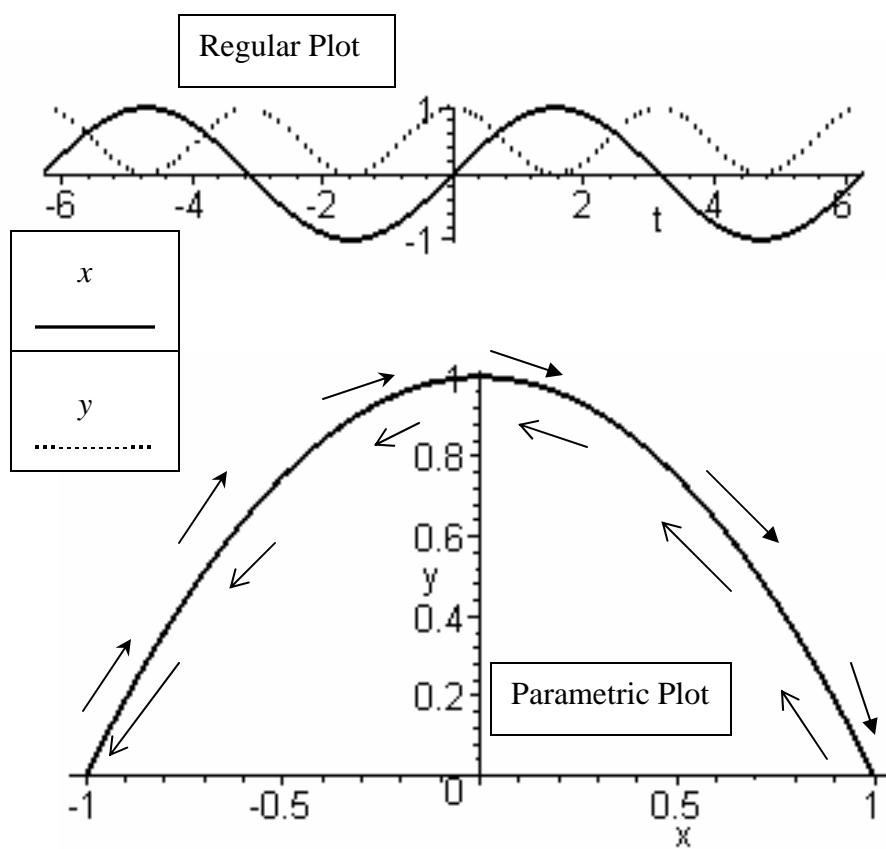


$$16) \quad x = 2 \sin t \quad y = 4 + \cos t \quad 0 \leq t \leq \frac{3\pi}{2}$$



Note: the horizontal axis is not the equation  $y = 0$

18)  $x = \sin t$     $y = \cos^2 t$     $-2\pi \leq t \leq 2\pi$



This plot starts at point  $(0,1)$ . From  $-2\pi$  to  $\frac{-3\pi}{2}$ , the graph moves to the right and ending up at point  $(1,0)$ . The arrow set:

From  $\frac{-3\pi}{2}$  to  $-\pi$ , the graph moves back to point  $(0,1)$ . From  $-\pi$  to  $\frac{-\pi}{2}$ , the graph continues to move left ending up at point  $(-1,0)$ . The arrow set:

From  $\frac{-\pi}{2}$  to  $0$ , the graph changes direction and retraces the previous path returning to point  $(0,1)$ . The arrow set:

This mound shape is repeated again in  $[0, 2\pi]$ .

20)

