

Homework 26 (9.1) probs. 6, 32, 42

6. Sketch (for t in $(-\infty, \infty)$)

$$\begin{cases} x = 2 - t \\ y = t^2 + 1 \end{cases}$$

Eliminate the parameter:

$$x = 2 - t \Rightarrow 2 - x = t$$

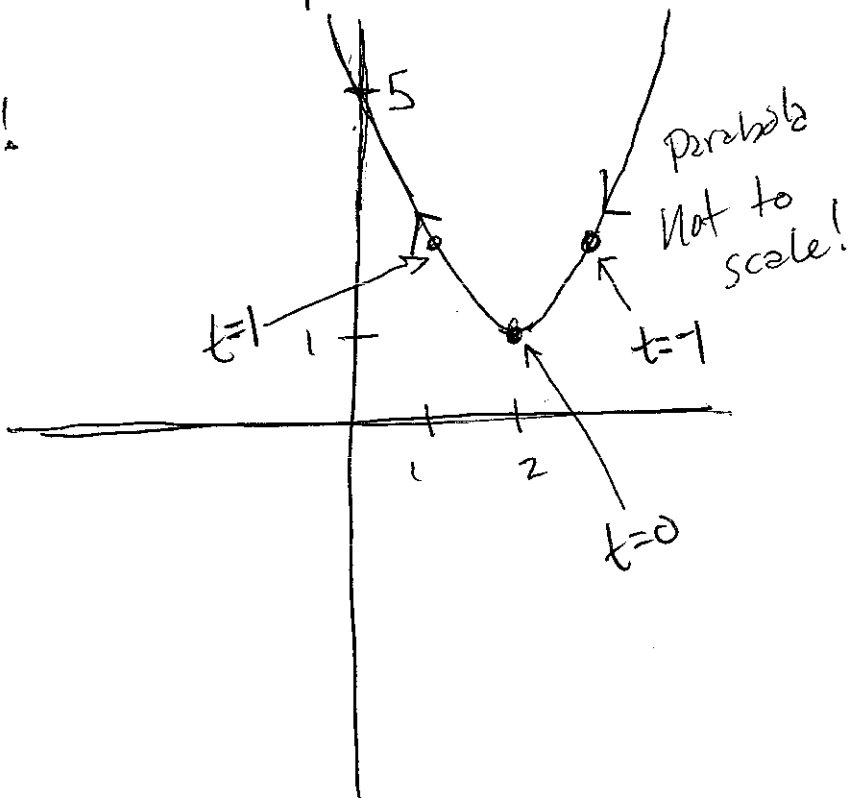
$$y = t^2 + 1 \Rightarrow y = (2 - x)^2 + 1$$

parabola w/ vertex $(2, 1)$

Also, ^{could} check some points:

t	(x, y)
-3	(5, 10)
-2	(4, 5)
-1	(3, 2)
0	(2, 1)
1	(1, 2)
2	(0, 5)
3	(-1, 10)

Get Sketch w/ orientation!



32. Find parametric eq^{ns} for the line segment from $(3, 1)$ to $(1, 3)$

$$x(t) = 3 + (-2)t = 3 - 2t$$

$$y(t) = 1 + 2t$$

for t in $[0, 1]$

42. Find all points of intersection of the 2 curves

$$\begin{cases} x_1 = t^2 \\ y_1 = t+1 \end{cases}$$

$$\begin{cases} x_2 = 2+s \\ y_2 = 1-s \end{cases}$$

Solve the system $x_1 = x_2 \Rightarrow t^2 = 2+s$
 $y_1 = y_2 \Rightarrow t+1 = 1-s$

$$t+1 = 1-s \Rightarrow t = -s$$

$$t^2 = 2+s \Rightarrow s^2 = 2+s \Rightarrow s^2 - s - 2 = 0$$

$S = -1$ gives the point of intersection $(1, 2)$ (also when $t = -s = 1$)

$$(s+1)(s-2) = 0$$

$$\boxed{s = -1 \text{ or } s = 2}$$

$S = 2$ gives the intersection $(4, -1)$ (also corresp. to $t = -2$)