

Section 8.4

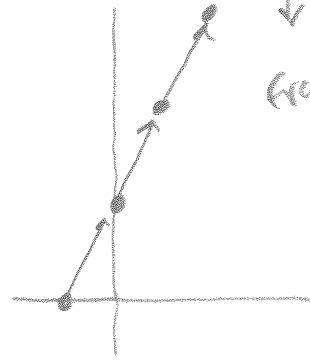
p.667; # 1, 3, 5, 9, 11, 19, 21, 23, ~~43~~, 44
 from $(-1, 6)$ to $(3, -2)$
 from $(0, 4)$ to $(5, 1)$

1) a)

t	0	1	2	3
x	-1	0	1	2
y	0	2	4	6

 $x = t - 1$
 $y = 2t$

b)



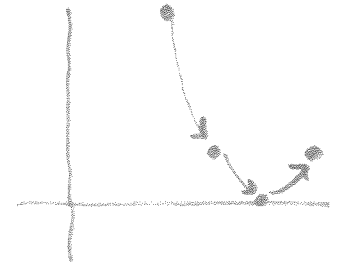
c) line

3) a)

t	0	1	2	3
x	2	3	4	5
y	4	1	0	1

 $x = t + 2$
 $y = (t - 2)^2$

b)

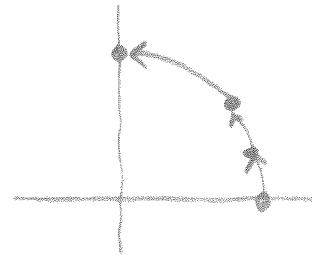


c) part of a parabola

5) a)

t	0	1	2	3
x	3	$\sqrt{8}$	$\sqrt{5}$	0
y	0	1	2	3

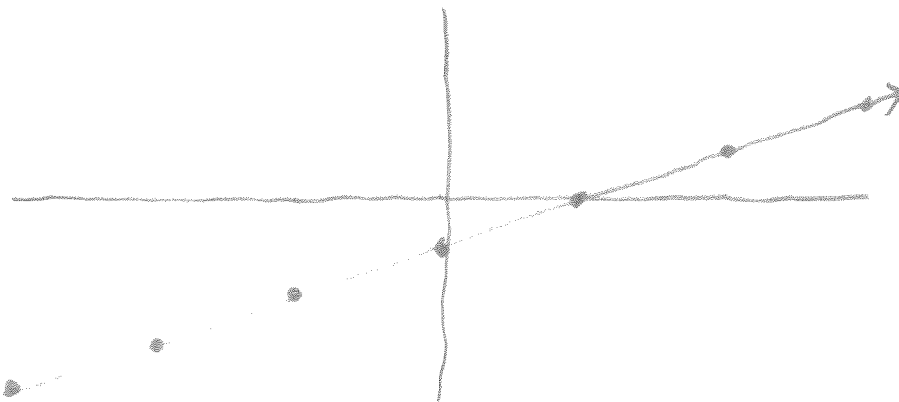
 $x = \sqrt{9 - t^2}$
 $y = t$
 $\sqrt{8} = 2.8$ $\sqrt{5} = 2.2$



c) 1/4 of a circle; $r = 3$

9) $x = 3t$ $y = t - 1$ $y = \frac{x}{3} - 1$
 $\frac{x}{3} = t$

t	-3	-2	-1	0	1	2	3
x	-9	-6	-3	0	3	6	9
y	-4	-3	-2	-1	0	1	2

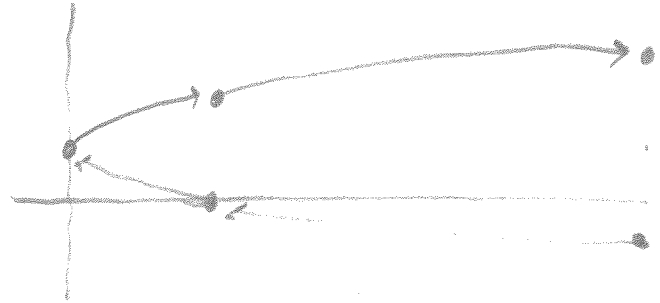


$$11) \quad x = 3t^2 \quad y = t + 1$$

$$\sqrt{\frac{x}{3}} = t \quad y = \sqrt{\frac{x}{3}} + 1$$

Parabola

t	-3	-2	-1	0	1	2	3
x	27	12	3	0	3	12	27
y	-2	-1	0	1	2	3	4



$$19) \quad x = 3\sin t \quad y = 3\cos t$$

$$x^2 + y^2 = (3\sin t)^2 + (3\cos t)^2$$

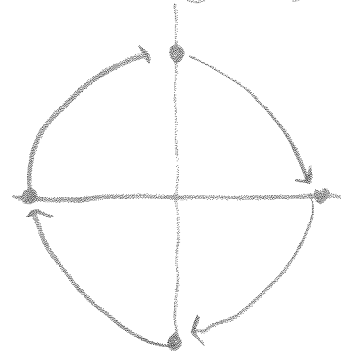
$$= 9\sin^2 t + 9\cos^2 t$$

$$= 9(\sin^2 t + \cos^2 t)$$

$$= 9(1)$$

$$x^2 + y^2 = 9 \quad \text{circle radius} = 3$$

t	π	$-\frac{\pi}{2}$	0	$\frac{\pi}{2}$	π
x	0	-3	0	3	0
y	-3	0	3	0	3



$$21) \quad x = 2\sin t \quad y = -2\cos t$$

$$x^2 + y^2 = (2\sin t)^2 + (-2\cos t)^2$$

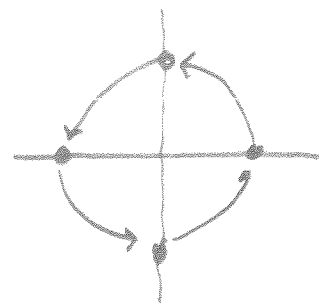
$$= 4\sin^2 t + 4\cos^2 t$$

$$= 4(\sin^2 t + \cos^2 t)$$

$$x^2 + y^2 = 4$$

circle; r = 2

t	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
x	0	2	0	-2	0
y	-2	0	2	0	-2



23) $x = 3\cos 2t$ $y = 3\sin 2t$ let $\theta = 2t$

$$x^2 + y^2 = (3\cos\theta)^2 + (3\sin\theta)^2$$

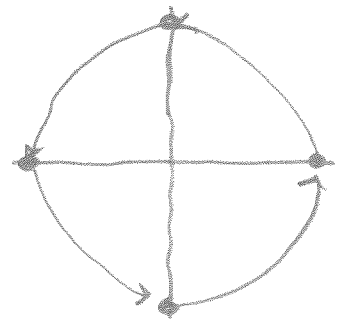
$$= 9\cos^2\theta + 9\sin^2\theta$$

$$= 9(\sin^2\theta + \cos^2\theta)$$

$$x^2 + y^2 = 9$$

circle $r=3$

t	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{3\pi}{4}$	1
x	3	0	-3	0	:
y	0	3	0	-3	0



42) ~~$x = 3\sin t$ $y = 3\cos t$~~

~~| | | | | |
|---|---|-----------------|-------|------------------|
| t | 0 | $\frac{\pi}{2}$ | π | $\frac{3\pi}{2}$ |
| x | 0 | 0 | 0 | 0 |
| y | 3 | 0 | -3 | 0 |~~

43) $2x + y = 4$ from $(-1, 6)$ to $(3, -2)$

$$y = -2x + 4 \quad m = -2$$

$$x(t) = -1 + 2t \quad y(t) = 6 - 4t$$

$$0 \leq t \leq 2$$

∞ others possible

44) $5x - 4y = 20$ from $(0, -5)$ to $(4, 0)$

$$-4y = -5x + 20$$

$$y = \frac{5}{4}x - 5$$

$$m = \frac{5}{4}$$

$$x(t) = 0 + 4t \quad y(t) = -5 + 5t$$

$$0 \leq t \leq 1$$

∞ others possible