Ex 3) Convert the polar equation to rectangular form. (describe graph)

a) $r = 3\sec\theta$

$\frac{}{\sec\theta} \quad \frac{}{\sec\theta}$

$r\cos\theta = 3$

$\boxed{x = 3}$

· vertical line

need $r^2 = r \cdot r$

$x^2 + y^2$

mult both sides by r

b) $r = -3\sin\theta$

$r^2 = -3r\sin\theta$

$x^2 + y^2 = -3y$

$x^2 + y^2 + 3y + \frac{9}{4} = \frac{9}{4}$

$\left(\frac{3}{2}\right)^2$

$\boxed{x^2 + \left(y + \frac{3}{2}\right)^2 = \frac{9}{4}}$

circle w/ center $(0, -3/2)$ and radius $= \frac{3}{2}$

Ex 4) Convert the rectangular equation to polar form. Change & solve for r.

a) $x = 2$

$\frac{r\cos\theta}{\cos\theta} = \frac{2}{\cos\theta}$

$\boxed{r = 2\sec\theta}$

b) $2x - 3y = 5$

$2r\cos\theta - 3r\sin\theta = 5$

$r(2\cos\theta - 3\sin\theta) = 5$

$\boxed{r = \frac{5}{2\cos\theta - 3\sin\theta}}$

c) $(x-3)^2 + y^2 = 9$

$(x-3)(x-3)$

$x^2 - 6x + 9 + y^2 = 9$

$x^2 + y^2 = 6x$

$r^2 = 6r\cos\theta$

$\frac{r \cdot r}{r} = \frac{6r\cos\theta}{r}$

$\boxed{r = 6\cos\theta}$

d) $(x+3)^2 + (y+3)^2 = 18$

$x^2 + 6x + 9 + y^2 + 6y + 9 = 18$

$x^2 + y^2 = -6x - 6y$

$r^2 = -6r\cos\theta - 6r\sin\theta$

$\frac{r \cdot r}{r} = \frac{r(-6\cos\theta - 6\sin\theta)}{r}$

$\boxed{r = -6\cos\theta - 6\sin\theta}$