3. (a) $p = 2 = \frac{\pi}{\frac{\pi}{2}} \Rightarrow y = A\tan(\frac{\pi}{2}x)$

(b) $p = 4 = \frac{\pi}{\frac{\pi}{4}}$, with horizontal shift of 2 units, $\Rightarrow y = A\tan(\frac{\pi}{4}[x-2])$ or $y = A\tan(\frac{\pi}{4}[x+2])$

7. (a) $\tan x = 1$ when terminal point on $y = x$ line, so $x = \frac{\pi}{4} + k\pi$, $k \in \mathbf{Z}$
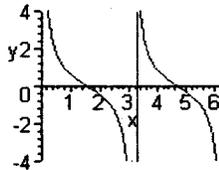
(b) $\tan x = -1$ when terminal point is on $y = -x$, so $x = \frac{3\pi}{4} + k\pi$, $k \in \mathbf{Z}$.

10. (a) undefined at $x = k\pi$, $k \in \mathbf{Z}$ (d)

(b) zeros at $x = \frac{\pi}{2} + k\pi$, $k \in \mathbf{Z}$

(c) period $= \pi$

asymptotes at
$x = 0, \pi, 2\pi$

2. (a) $-60° = -60° \frac{\pi}{180°} = -\frac{\pi}{3}$ (b) $\frac{\pi}{4}$ (c) $-\frac{3\pi}{2}$ (d) $\frac{2\pi}{9}$ (e) $-\frac{2\pi}{3}$

3. (a) $\frac{3\pi}{4} = \frac{3\pi}{4}\frac{180°}{\pi} = 135°$ (b) $-135°$ (c) $150°$ (d) $270°$ (e) $225°$ (f) $-183.35°$ (g) $229.18°$

4. (a) 20 seconds yields $\frac{2\pi}{3}$ radians, hence distance $= \frac{2\pi}{3}(6) = 4\pi$ in.

6. (a) distance $= \frac{1}{60}° \frac{\pi}{180°}(3960) = \frac{11\pi}{30}$ mi ≈ 1.15 mi, $\frac{11\pi}{30}(5280) = 1936\pi$ ft ≈ 6082 ft.

(b) $\frac{1}{60}° \frac{\pi}{180°}(r)(5280) = 6076 \Rightarrow r \approx 3956$ mi.

11. $P(\theta) = (-\frac{12}{13}, \frac{5}{13})$, $P(-\theta) = (-\frac{12}{13}, -\frac{5}{13})$, $P(\pi - \theta) = (\frac{12}{13}, \frac{5}{13})$

(a) $-\frac{12}{13}$ (b) $-\frac{5}{12}$ (c) $-\frac{12}{13}$ (d) $-\frac{5}{13}$ (e) $\frac{5}{12}$