

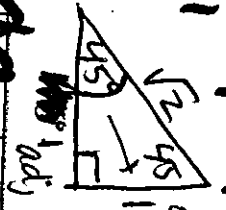
$y = \tan x$
 $\tan 60^\circ = \sqrt{3}$



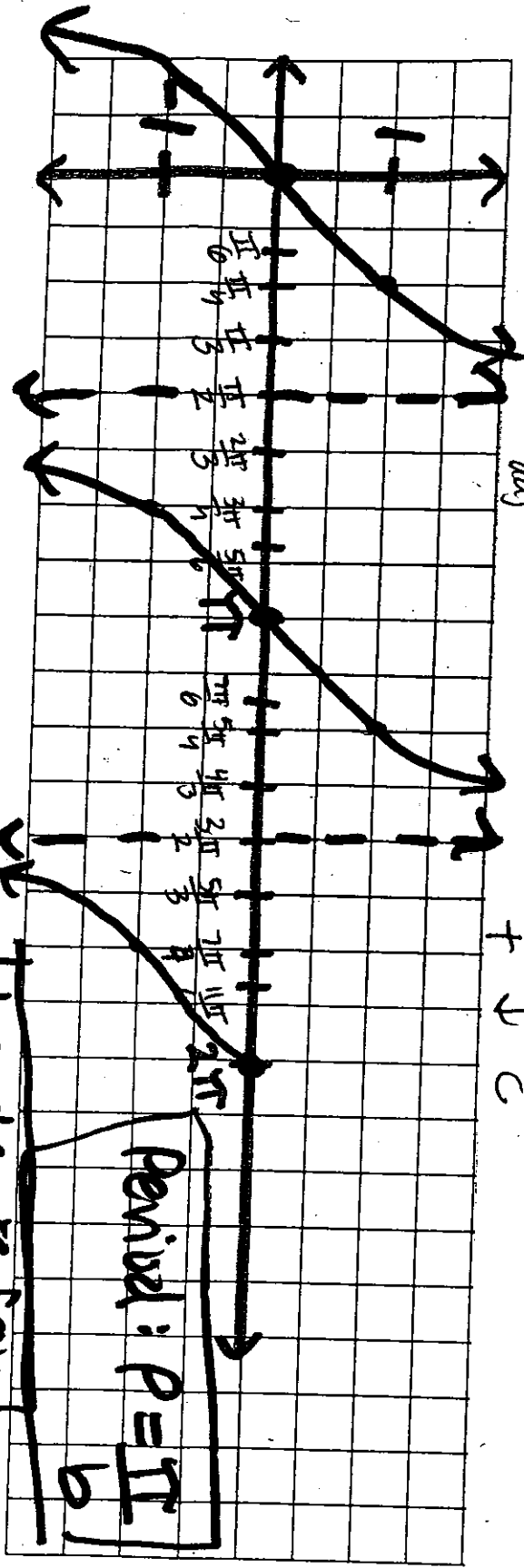
$\tan \theta = \frac{\text{opp}}{\text{adj}}$

$\tan 30^\circ = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

	30°	45°	60°	90°	120°	135°	150°	180°	210°	225°	240°						
x	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	$\frac{2\pi}{3}$	$\frac{3\pi}{4}$	$\frac{5\pi}{6}$	π	$\frac{7\pi}{6}$	$\frac{5\pi}{4}$	$\frac{4\pi}{3}$	$\frac{3\pi}{2}$	$\frac{5\pi}{3}$	$\frac{7\pi}{4}$	$\frac{11\pi}{6}$	2π
y	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	undefined	$-\sqrt{3}$	-1	$-\frac{1}{\sqrt{3}}$	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	undefined	$-\sqrt{3}$	-1	$-\frac{1}{\sqrt{3}}$	0



$\tan 45^\circ = 1$



$y = \tan x$

Period = π

asymptote occur at $\theta = \frac{\pi}{2}$ repeats every π units

$$\text{Period} = \frac{\pi}{b}$$

$$y = \tan \theta$$

One cycle will occur from

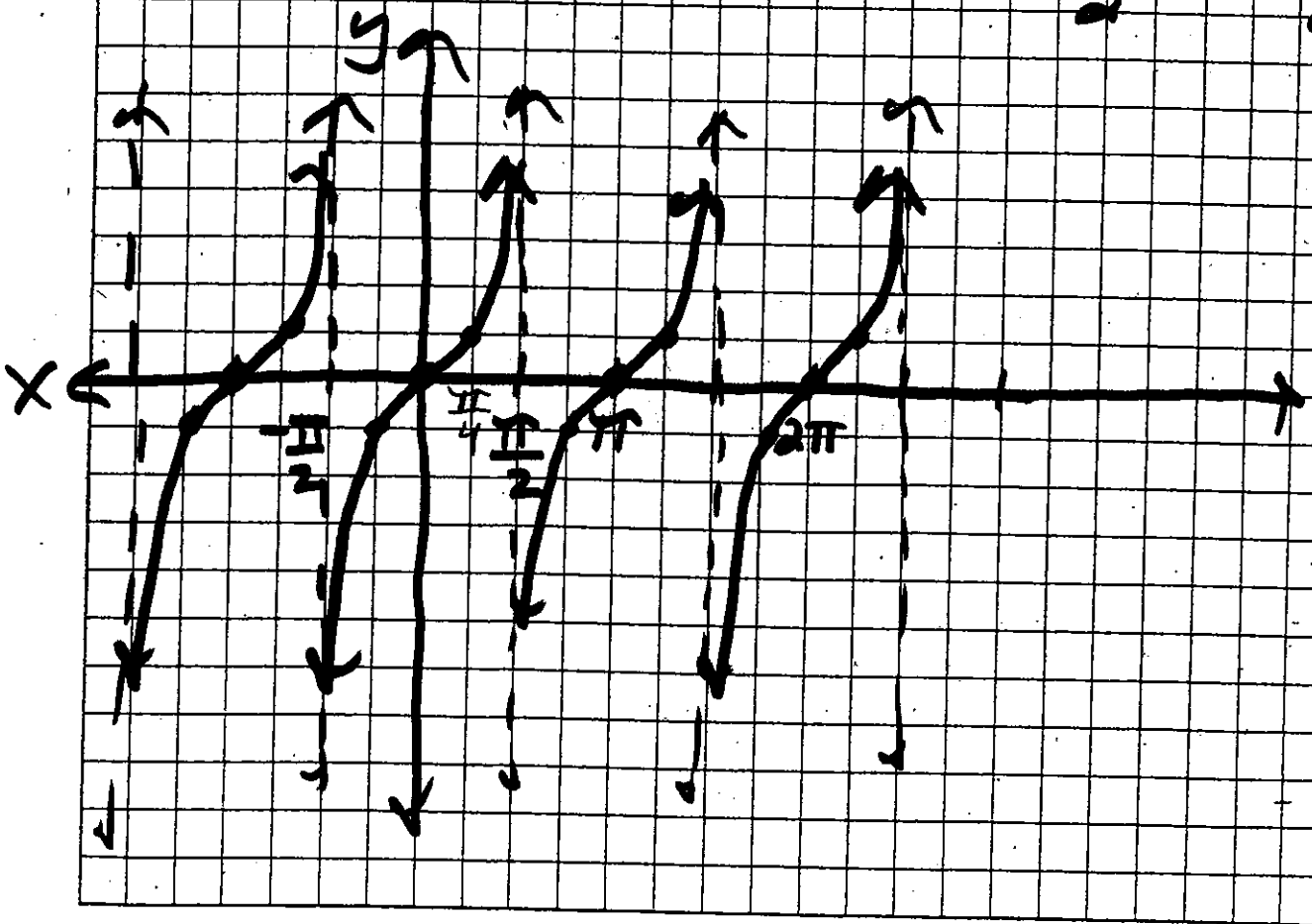
$$-\frac{\pi}{2b} \text{ to } \frac{\pi}{2b}$$

↑
asymptotes

$$y = a \tan b\theta$$

$$y = \tan \theta \quad p = \frac{\pi}{1} = \pi$$

Cycles occur from $-\frac{\pi}{2}$ to $\frac{\pi}{2}$



13.6 $y = a \tan b\theta$

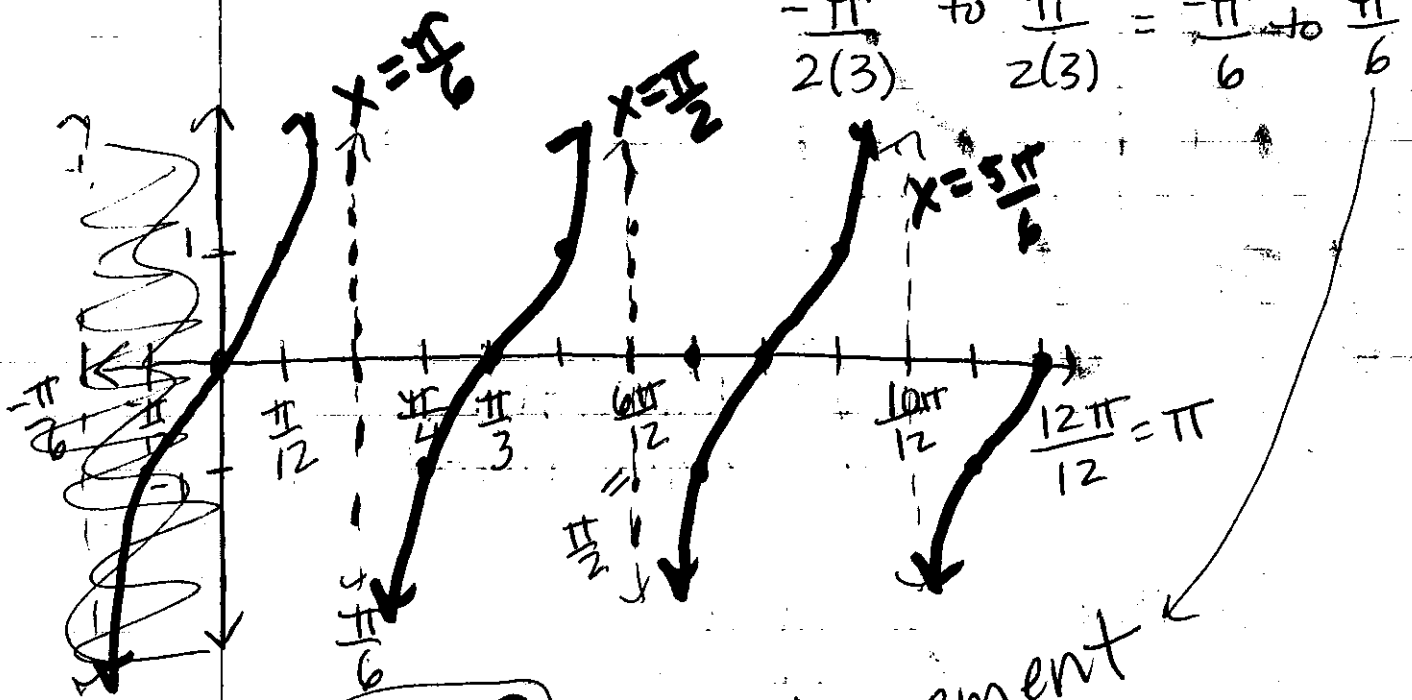
(ex) $y = \tan 3\theta$, Graph $0 \leq \theta \leq \pi$

Period = $\frac{\pi}{b}$

$P = \frac{\pi}{3}$

1 cycle from $-\frac{\pi}{2b}$ to $\frac{\pi}{2b}$

$-\frac{\pi}{2(3)}$ to $\frac{\pi}{2(3)} = -\frac{\pi}{6}$ to $\frac{\pi}{6}$



$\frac{1}{2} \cdot \frac{\pi}{6} = \frac{\pi}{12}$

increment take $\frac{1}{2}$

Window

Graph $0 \leq \theta \leq \pi$

table setup
tbl start : 0
 $\Delta TBI : \pi/12$ increment

X-min : 0
X-max : π
X-scale : $\frac{\pi}{12}$
Y-min : -4
Y-max : 4
Y-scl = 1

ex 2

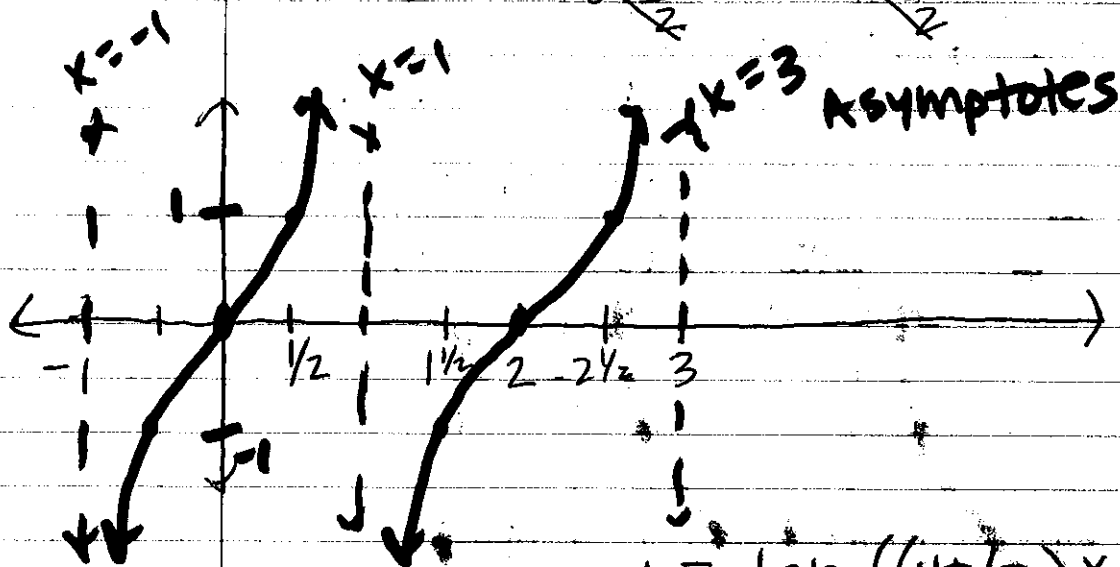
(b) $y = \tan \frac{4\pi}{2} \theta, 0 \leq \theta < 3$

$p = \frac{\pi}{4\pi/2} = \pi \cdot \frac{2}{4\pi} = 2$

Cycles = $\frac{-\pi}{2 \cdot \frac{\pi}{2}}$ to $\frac{\pi}{2 \cdot \frac{\pi}{2}} = -1$ to 1

take $\frac{1}{2}$

$1 \cdot \frac{1}{2} = \frac{1}{2}$



$y = \tan((4\pi/2)x)$
calculator

p. 752

(16) $y = \tan 2\theta$

$p = \frac{\pi}{2}$

Cycles

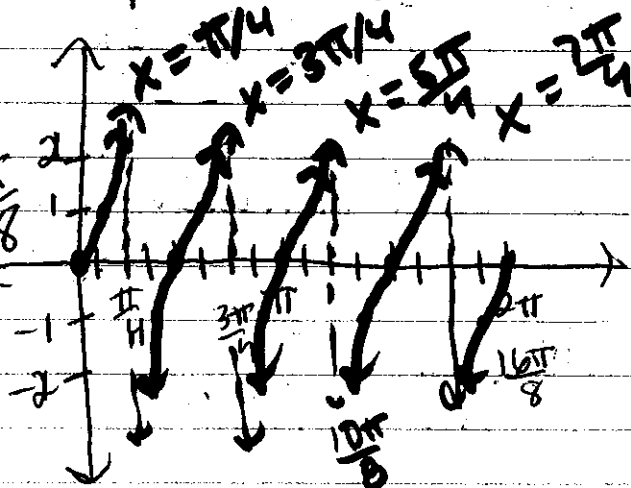
$\frac{-\pi}{2(2)}$ to $\frac{\pi}{2(2)}$

$\frac{-\pi}{4}$ to $\frac{\pi}{4}$

increments

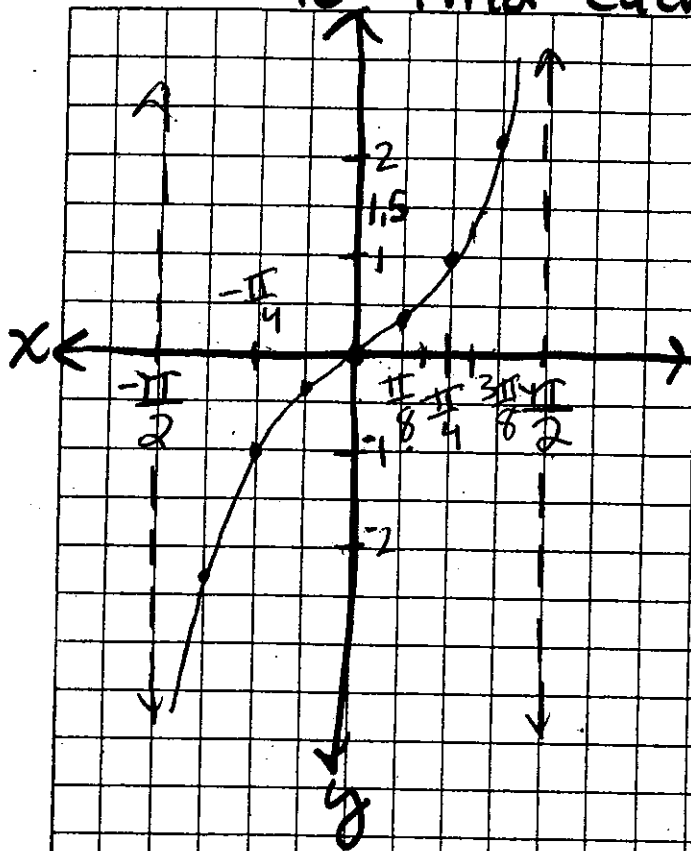
$\frac{1}{2} \cdot \frac{\pi}{4} = \frac{\pi}{8}$

Graph from 0 to 2π



ex 1

Use the graph of $y = \tan \theta$ to find each value



① $\tan\left(-\frac{\pi}{4}\right) = -1$

② $\tan\left(\frac{\pi}{4}\right) = 1$

③ $\tan 0 = 0$

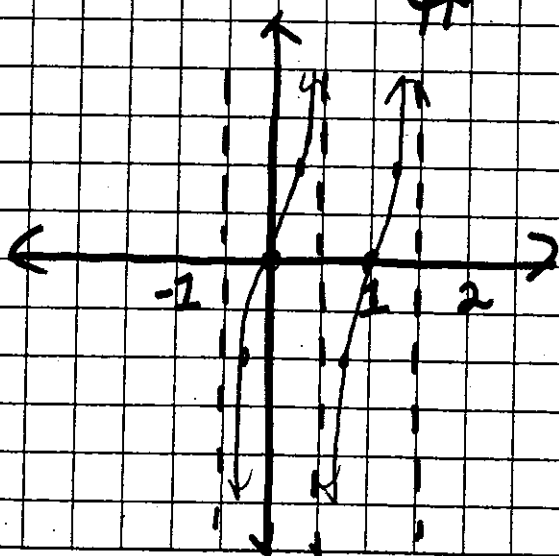
④ $\tan \frac{\pi}{3}$

ex ② $y = \tan \pi \theta$

Period = $\frac{\pi}{\pi} = 1$

Sketch 2 cycles.

one cycle is from $\frac{-\pi}{2\pi}$ to $\frac{+\pi}{2\pi}$
 $-\frac{1}{2}$ to $\frac{1}{2}$



Since, $a = 1$ $\left(-\frac{1}{4}, -1\right)$ and $\left(\frac{1}{4}, 1\right)$ are on the graph.

$$\star \textcircled{11} y = \tan 5\theta \quad p = \frac{4\pi}{5}$$

$$-\frac{\pi}{2(5)} + 0 \frac{\pi}{2(5)} = -\frac{\pi}{10} \text{ to } \frac{\pi}{10}$$

asymptotes ~~is~~ $x = -\frac{\pi}{10}$

$$x = \frac{\pi}{10}$$

$$x = \frac{4\pi}{5}$$

$$x = \frac{3\pi}{10}$$

} add $\frac{1}{10}$

} add $\frac{1}{10}$

HW: p. 751-752

(1-10, 12-15, 17, 23,
26, 27)