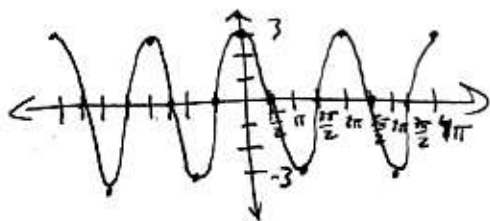


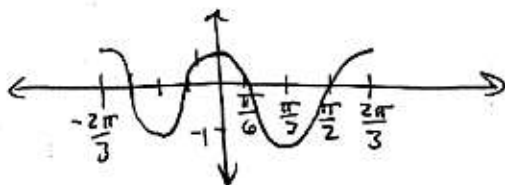
Solutions Homework 143

Section 6.5

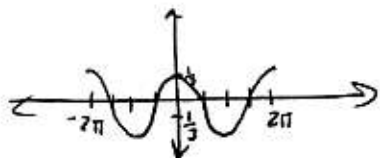
③ a) $y = 3 \cos x$
 amplitude: 3
 period: 2π



b) $y = \cos 3x$
 amplitude: 1
 period: $\frac{2\pi}{3}$



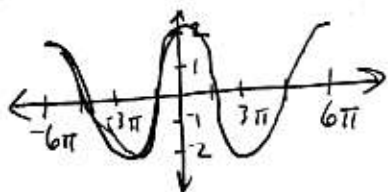
c) $y = \frac{1}{3} \cos x$
 amplitude: $\frac{1}{3}$
 period: 2π



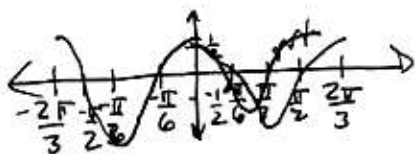
d) $y = \cos \frac{1}{3} x$
 amplitude: 1
 period: 6π



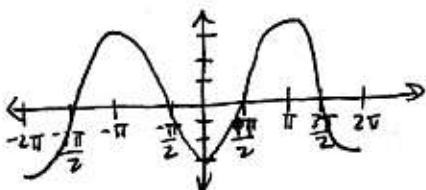
e) $y = 2 \cos \frac{1}{3} x$
 amplitude: 2
 period: 6π



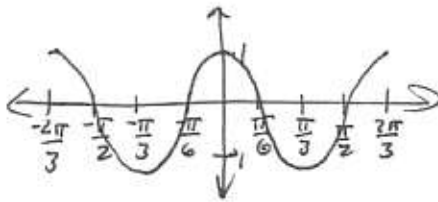
f) $y = \frac{1}{2} \cos 3x$
 amplitude: $\frac{1}{2}$
 period: $\frac{2\pi}{3}$



g) $y = -3 \cos x$
 amplitude: 3
 period: 2π



④ $y = \cos(-3x)$
 amplitude: 1
 period: $\frac{2\pi}{3}$



⑤ $y = \sin(x - \frac{\pi}{2})$

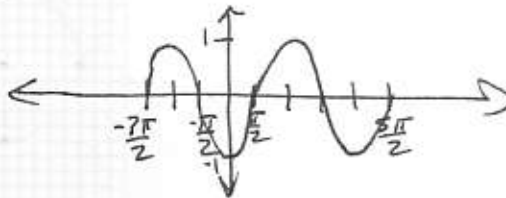
Amp: 1

Period: 2π

Phase Shift: $-\frac{(-\frac{\pi}{2})}{1} = \frac{\pi}{2}$

One period $0 \leq x - \frac{\pi}{2} \leq 2\pi$

$\frac{\pi}{2} \leq x \leq \frac{5\pi}{2}$



⑥ $y = 4 \cos(x - \frac{\pi}{4})$

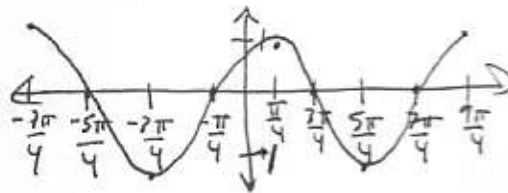
Amp: 4

Period: 2π

Phase Shift: $-\frac{(-\frac{\pi}{4})}{1} = \frac{\pi}{4}$

One Period: $0 \leq x - \frac{\pi}{4} \leq 2\pi$

$\frac{\pi}{4} \leq x \leq \frac{9\pi}{4}$



⑦ $y = -\cos(3x + \pi) - 2$ *Shifted down 2 units*

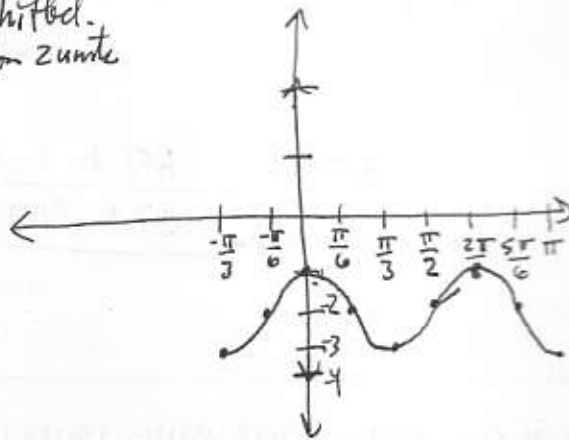
Amp: 1

Period: $\frac{2\pi}{3}$

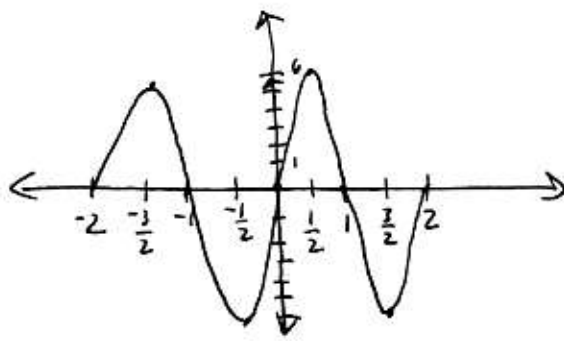
Phase Shift: $-\frac{\pi}{3}$

One period $0 \leq 3x + \pi \leq 2\pi$

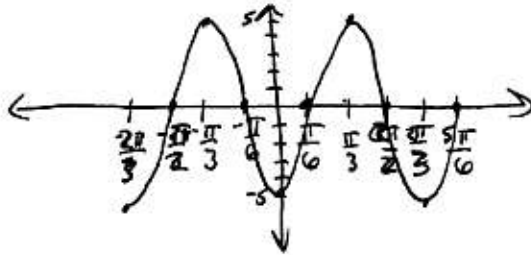
$-\frac{\pi}{3} \leq x \leq \frac{\pi}{3}$



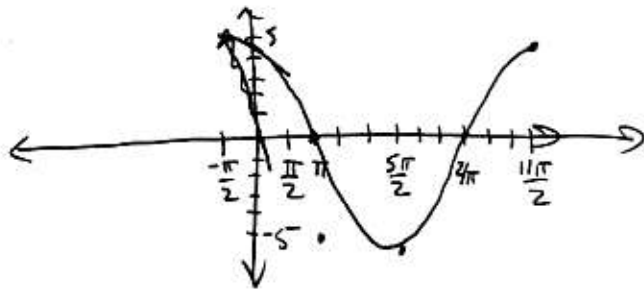
②① $y = 6 \sin(\pi x)$
 Amp: 6
 Period: $\frac{2\pi}{\pi} = 2$
 Phase shift: 0



②⑦ $y = 5 \sin(3x - \frac{\pi}{2})$
 Amp: 5
 Period: $\frac{2\pi}{3}$
 Phase Shift: $\frac{-(-\frac{\pi}{2})}{3} = \frac{\pi}{6}$



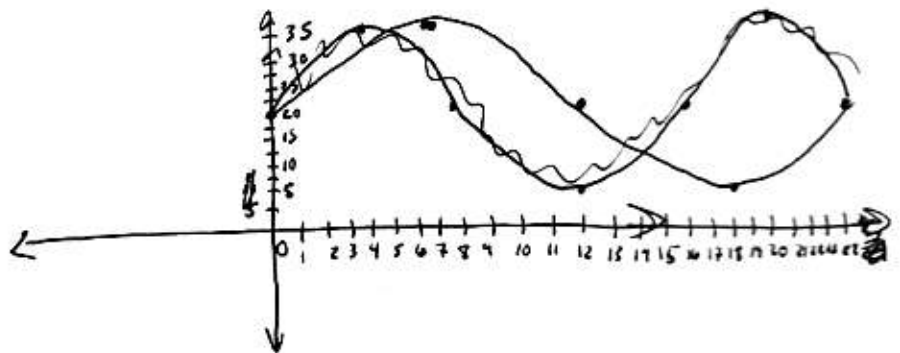
③① $y = -5 \cos(\frac{1}{3}x + \frac{\pi}{6})$
 Amp: 5
 Period: $\frac{2\pi}{\frac{1}{3}} = 6\pi$
 Phase Shift: $\frac{-\frac{\pi}{6}}{-\frac{1}{3}} = -\frac{\pi}{2}$



Period $0 \leq \frac{1}{3}x + \frac{\pi}{6} \leq 2\pi$
 $-\frac{\pi}{6} \leq \frac{1}{3}x \leq \frac{11\pi}{6}$
 $-\frac{\pi}{2} \leq x \leq \frac{11\pi}{2}$

④① a) Amp: 4
 Period: 2π
 Phase Shift: 0
 b) $y = -4 \sin x$

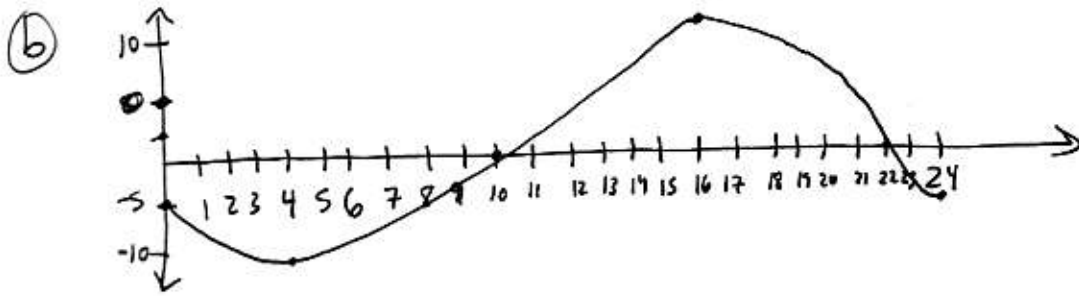
⑤③ $y = 20 + 15 \sin \frac{\pi}{12} t$ Period $\frac{2\pi}{\frac{\pi}{12}} = 24$



55) $f(t) = a \sin(bt + c) + d$

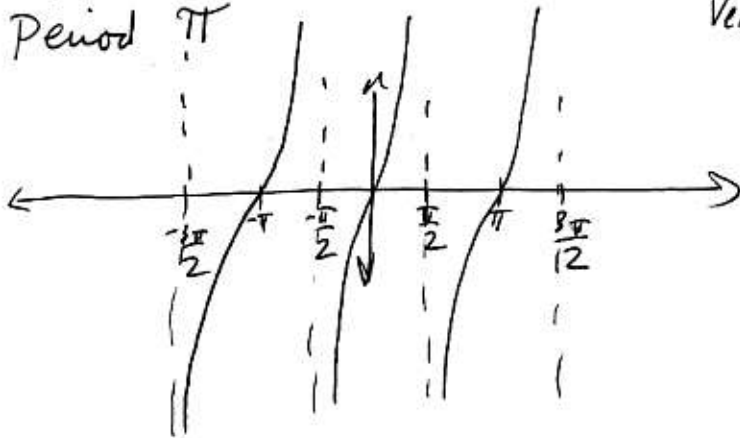
a) $a = 10, b = \frac{\pi}{12}, d = 0$

$4 = 10 \sin\left(\frac{\pi}{12}t + c\right)$
 $-2 = \frac{-c}{\frac{\pi}{12}}$
 $c = \frac{\pi}{6}$
 $f(t) = 10 \sin\left(\frac{\pi}{12}t + \frac{\pi}{6}\right)$



Section 6.6

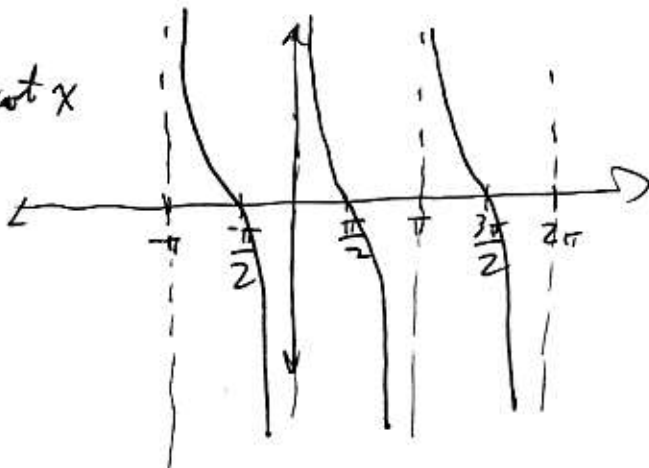
1) $y = 4 \tan x$
 Period π



Vertical stretch
of a factor of 4

3) $y = 3 \cot x$

period π

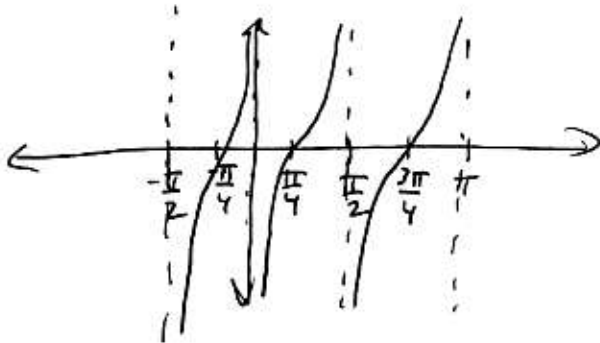


Vertical stretch
of a factor of 3

(15) $y = 2 \tan(2x + \frac{\pi}{2})$

period $\frac{\pi}{2}$

One period lies in $-\frac{\pi}{2} \leq 2x + \frac{\pi}{2} < \frac{\pi}{2}$
 $-\pi < 2x < 0$
 $-\frac{\pi}{2} < x < 0$



(19) $y = \cot(x - \frac{\pi}{2})$

Period: π

One period lies in $-\frac{\pi}{2} < x - \frac{\pi}{2} < \frac{\pi}{2}$

$0 < x - \frac{\pi}{2} < \pi$
 $\frac{\pi}{2} < x < \frac{3\pi}{2}$

