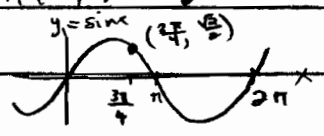
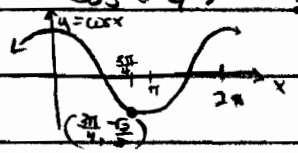
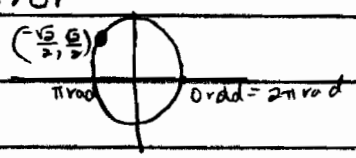
Math 1290 HW 8 Sec 1.8: 2, 8, 12, 21, 22, 28 cd, 32 ab, 34, 36, 40, 42

2. $\sin\left(\frac{3\pi}{4}\right) = \frac{\sqrt{2}}{2} \approx 0.707$ $\cos\left(\frac{3\pi}{4}\right) = -\frac{\sqrt{2}}{2} \approx -0.707$

a) 

b) 

c) 

8. $330° \rightarrow$ rad recall (2π rad = 360°)

$$\frac{330°}{360°} = \frac{x \text{ rad}}{2\pi \text{ rad}} \rightarrow x \text{ rad} = \frac{330°}{360°} \cdot 2\pi \text{ rad} = \boxed{\frac{11\pi}{6} \text{ rad}}$$

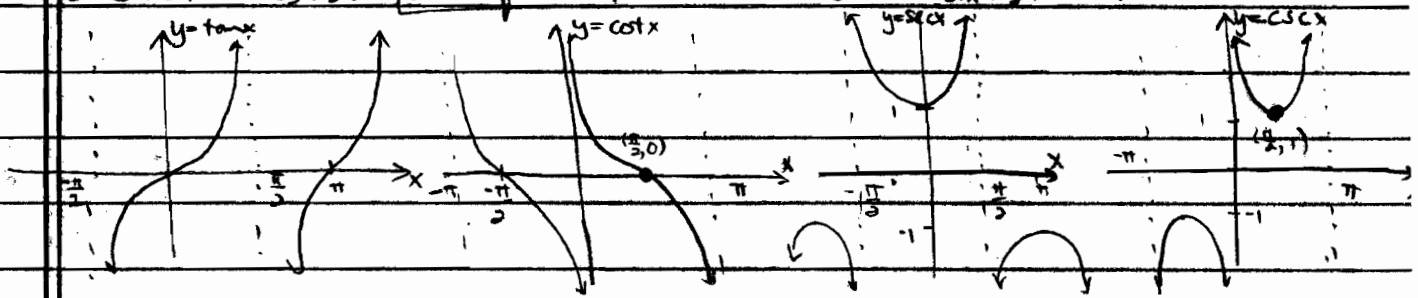
12. $\frac{\pi}{5}$ rad $\rightarrow$ degrees

$$\frac{\frac{\pi}{5} \text{ rad}}{2\pi \text{ rad}} = \frac{x°}{360°} \Rightarrow x° = \frac{\frac{\pi}{5}}{2\pi} 360° = \boxed{36°}$$

21. $x = \frac{\pi}{2}$ $\sin\left(\frac{\pi}{2}\right) = 1$ $\cos\left(\frac{\pi}{2}\right) = 0$

$\tan\left(\frac{\pi}{2}\right) = \frac{\sin\left(\frac{\pi}{2}\right)}{\cos\left(\frac{\pi}{2}\right)} =$ **undefined** $\cot\left(\frac{\pi}{2}\right) = \frac{\cos\left(\frac{\pi}{2}\right)}{\sin\left(\frac{\pi}{2}\right)} = \frac{0}{1} = 0$

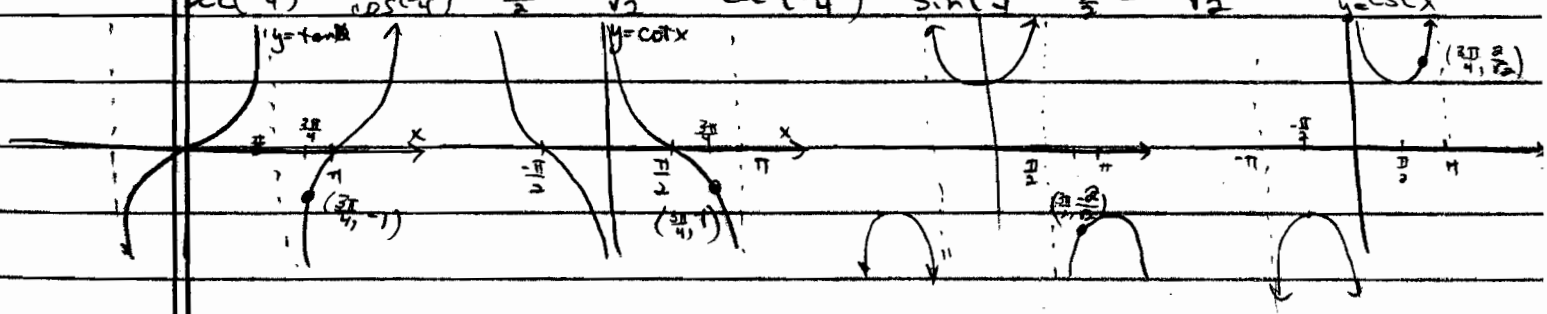
$\sec\left(\frac{\pi}{2}\right) = \frac{1}{\cos\left(\frac{\pi}{2}\right)} =$ **undefined** $\csc\left(\frac{\pi}{2}\right) = \frac{1}{\sin\left(\frac{\pi}{2}\right)} = \frac{1}{1} = 1$



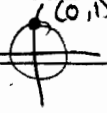
22. $x = \frac{3\pi}{4}$ $\sin\left(\frac{3\pi}{4}\right) = \frac{\sqrt{2}}{2}$, $\cos\left(\frac{3\pi}{4}\right) = -\frac{\sqrt{2}}{2}$

$\tan\left(\frac{3\pi}{4}\right) = \frac{\sin\left(\frac{3\pi}{4}\right)}{\cos\left(\frac{3\pi}{4}\right)} = \frac{\frac{\sqrt{2}}{2}}{-\frac{\sqrt{2}}{2}} = -1$ $\cot\left(\frac{3\pi}{4}\right) = \frac{\cos\left(\frac{3\pi}{4}\right)}{\sin\left(\frac{3\pi}{4}\right)} = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = -1 = \frac{1}{\tan\left(\frac{3\pi}{4}\right)}$

$\sec\left(\frac{3\pi}{4}\right) = \frac{1}{\cos\left(\frac{3\pi}{4}\right)} = \frac{1}{-\frac{\sqrt{2}}{2}} = -\frac{2}{\sqrt{2}}$ $\csc\left(\frac{3\pi}{4}\right) = \frac{1}{\sin\left(\frac{3\pi}{4}\right)} = \frac{1}{\frac{\sqrt{2}}{2}} = \frac{2}{\sqrt{2}}$

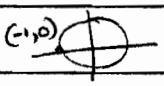


28. c) $\theta = \frac{\pi}{2}$



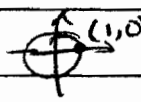
$\sin^2(\frac{\pi}{2}) + \cos^2(\frac{\pi}{2}) = 1^2 + 0^2 = 1^2 = 1$ ✓

d) $\theta = \pi$



$\sin^2(\pi) + \cos^2(\pi) = 0^2 + (-1)^2 = (-1)^2 = 1$ ✓

32. a) $\theta = 0$ b) $\theta = \frac{\pi}{4}$



$\sin(2 \cdot 0) = 2\sin(0)\cos(0)$

$\sin(0) = 2(\sin(0)\cos(0))$

$0 = 2(0)(1) = 0$ ✓

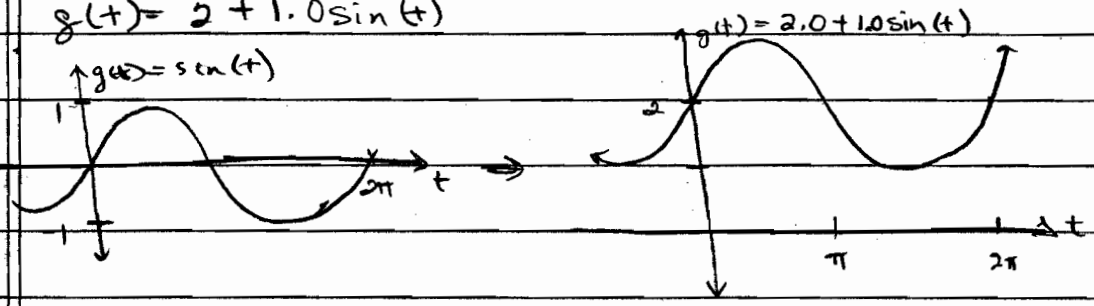
$\sin(2\frac{\pi}{4}) = 2\sin(\frac{\pi}{4})\cos(\frac{\pi}{4})$

$\sin(\frac{\pi}{2}) = 2\sin(\frac{\pi}{4})\cos(\frac{\pi}{4})$

$1 = 2(\frac{\sqrt{2}}{2})(\frac{\sqrt{2}}{2})$

$1 = \frac{(\sqrt{2})^2}{2} = \frac{2}{2} = 1$ ✓

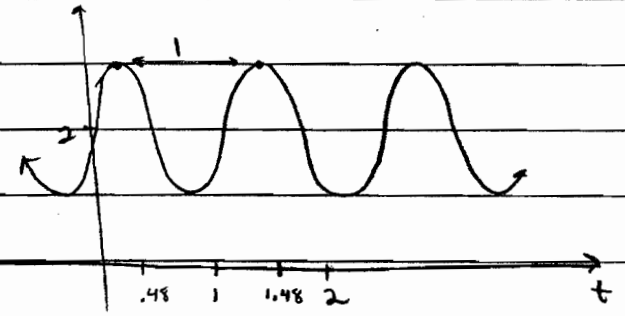
34. $g(t) = 2 + 1.0\sin(t)$



36. $h(t) = 2.0 + 1.0\cos(2\pi t - 3.0)$

$h(t) = 2.0 + 1.0\cos(2\pi(t - \frac{3}{2\pi}))$

$h(t) = 2.0 + 1.0\cos(2\pi(t - 0.48))$



Average = 2

Amplitude = 1

phaseshift = 0.48

period = 1

40. Average = 2

minimum = 1.8

maximum = 2.2

amplitude = $\frac{\text{max} - \text{min}}{2} = 0.2$

period = 0.2

phase shift = 0.1

42. $g(t) = 4.0 + 3.0\cos(2\pi(t-5.0))$

average = 4

Amplitude = 3

period = 1

phase shift = 5

maximum = 7

minimum = 1