Midterm 3 Review Answers to Even Problems

5.2 #50 (a) $\cos\theta \simeq 0.76$, $\tan\theta \simeq 0.855$, $\cot\theta \simeq 1.169$
$\sec\theta \simeq 1.315$, $\csc \simeq 1.538$

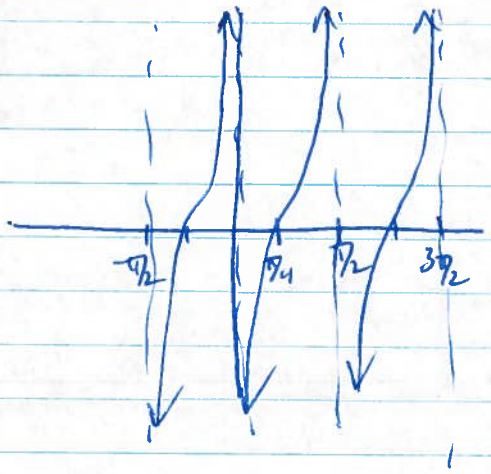
(b) $\cos\theta = \frac{-5}{\sqrt{41}}$, $\sin\theta = \frac{-4}{\sqrt{41}}$, $\tan\theta = \frac{4}{5}$

$\csc\theta = \frac{-\sqrt{41}}{4}$, $\sec\theta = \frac{-\sqrt{41}}{5}$

5.3 #14 $\cos\theta = \frac{-6}{\sqrt{37}}$, $\sin\theta = \frac{1}{\sqrt{37}}$, $\tan\theta = -1/6$
$\sec\theta = \frac{\sqrt{37}}{6}$, $\csc\theta = \sqrt{37}$, $\cot\theta = -6$

5.4 #36 $y = \tan(2(x - \pi/4))$

amp: N/A
period: $\pi/2$
shift $\pi/4$ to right



5.5 #14 (a) π (b) $5\pi/6$ (c) $-\pi/4$ (d) $-\pi/3$

5.5 #26 (a) 1 (b) $\pi/6$

5.5 #30 (a) $\frac{1}{2}$ (b) $\sqrt{5}/3$

5.6 #6 $\alpha = 28.95°$, $b = 418.7 \sin 61.05°$, $a = 418.7 \cos 61.05°$

5.6 #12 $c \simeq 280.4$, $\alpha = \tan^{-1}\left(\frac{145}{240}\right) \simeq 31.1°$
$\beta = \tan^{-1}\left(\frac{240}{145}\right) \simeq 58.9°$

5.6 #30 $x = \frac{4.5}{\sin 40^\circ} = 4.5 \csc 40^\circ$ ft ≈ 7 ft
≈ 84 inches

5.7 #16 $\alpha = 30^\circ$, $b = 60\sin 50^\circ$, $c = 60\sin 100^\circ$
(ASA case) (use Law of Sines)

6.1 #22 $x = 0, \frac{\pi}{3}, \pi, \frac{4\pi}{3}$

6.1 #24 $x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

6.1 #44 principal value soln: $x = \frac{\tan^{-1}(\sqrt{3}-1)}{2}$

soln for $x \in [0, 2\pi)$: $x = \frac{\arctan(\sqrt{3}-1)}{2}, \frac{\arctan(\sqrt{3}-1)}{2} + \frac{\pi}{2}$,
$\frac{\arctan(\sqrt{3}-1)}{2} + \pi, \frac{\arctan(\sqrt{3}-1)}{2} + \frac{3\pi}{2}$

soln for $x \in (-\infty, \infty)$: $x = \frac{\arctan(\sqrt{3}-1)}{2} + n\pi$, $n \in \mathbb{Z}$

6.2 #44 hint: multiply LHS by $\left(\frac{1-\cos\theta}{1-\cos\theta}\right)$

6.2 #50 hint: start w/ LHS & get common denominator; then use Pythagorean identities

6.4 #10 (a) 2θ in QIII or QIV (b) $\theta/2$ in QI

6.4 #38 $\sin(2\theta) = \frac{-120}{169}$, $\cos(2\theta) = \frac{-119}{169}$, $\tan(2\theta) = \frac{120}{119}$

$\sin(\frac{\theta}{2}) = \frac{3}{\sqrt{13}}$, $\cos(\theta/2) = \frac{-2}{\sqrt{13}}$, $\tan(\theta/2) = -3/2$

8.1 #8 (a) arithmetic (b) $d = 10$ (c) 35

8.1 #12 (a) geometric (b) $r = \frac{1}{5}$ (c) $= 1/5$

8.1 #14 (a) none (b) first, third, fifth, etc. terms form an arithmetic seq w/ $d=-1$ and then 2nd, 4th, 6th, ..etc. terms form another arithmetic seq. w/ $d=-1$

(c) 5

8.1 #48 -200

8.3 #16 -7

8.3 #20 $a_n = 7(3)^{n-1}$, sum is $\sum_{n=1}^{\infty} 7(3)^{n-1}$

8.3 #24 -190