Review 5.4-5.6

1. $2\sin 100 \cos 100$
$= \boxed{\sin 200^\circ}$

2. $\dfrac{2\tan 40}{1-\tan^2 40}$
$= \boxed{\tan 80^\circ}$

22. $\sin 2u = -\frac{24}{25}$

$\cos 2u = \frac{7}{25}$

$\tan 2u = -\frac{24}{7}$

23. $\sin 2u = \frac{15}{17}$

$\cos 2u = \frac{8}{17}$

$\tan 2u = \frac{15}{8}$

42. $\cos 2t - \cos t = 0$
$2\cos^2 t - 1 - \cos t = 0$
$2\cos^2 t - \cos t - 1 = 0$
$(2\cos t + 1)(\cos t - 1) = 0$
$\cos t = -\frac{1}{2}$ $\quad \cos t = 1$
$t = \frac{2\pi}{3}, \frac{4\pi}{3}$ $\quad t = 0$

44. $\cos 2x + 5\cos x - 2 = 0$
$2\cos^2 x - 1 + 5\cos x - 2 = 0$
$2\cos^2 x + 5\cos x - 3 = 0$
$(2\cos x - 1)(\cos x + 3) = 0$
$\cos x = \frac{1}{2}$ $\quad \cos x = -3$
$x = \frac{\pi}{3}, \frac{5\pi}{3}$ $\quad$ no soln

51. Law of sines AAS
$C = 68^\circ \quad b \approx 3.9 \quad c \approx 6.6$

52. Law of Sines SSA 1 Δ
$A \approx 36^\circ \quad C \approx 34^\circ \quad c \approx 4.8$

53. Law of sines SSA
No Δ formed

54. Law of Sines AAS
$B = 117.7^\circ \quad b \approx 26.6$
$c \approx 16.4$

55. Law of Sines ASA
$C = 72°$ $a \approx 2.9$ $b \approx 5.1$

56. Law of Sines AAS
$B = 102°$ $a \approx 19.5$
$b \approx 48.9$

57. Law of Cosines SSS
$A \approx 44.4°$
$B \approx 78.5°$
$C \approx 57.1°$

58. Law of Sines SSA
$B \approx 41.6°$
$C \approx 53.4°$
$c \approx 4.8$

* You will have an ambiguous case with 2 Δs on the test! Know how to find missing angles and sides for the 2nd Δ as well

59. SSS

$s = \frac{3+5+6}{2} = 7$

$A = \sqrt{7(7-3)(7-5)(7-6)}$

$\sqrt{7(4)(2)(1)}$

$\sqrt{56} \approx$ **7.48 units²**

60) $A = \frac{1}{2}(10)(6)\sin 50$

$\approx$ **22.98 units²**

61) a) 2 Δs: $5.6 < b < 12$ $h = 12\sin 28 = 5.6$

b) 1 Δ: 5.6 or $b \geq 12$ see necessary conditions in notes

c) 0 Δ: $b < 5.6$

62. a) 102.5FT
b) 96.4FT

63. ≈ 0.6 mi

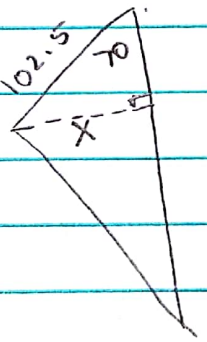
64. ≈ 849.77 ft

(62) a) $\angle C = 45°$

$$\frac{AC}{\sin 65} = \frac{80}{\sin 45}$$

$$AC = \frac{80\sin(65)}{\sin(45)}$$

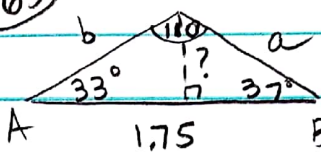
a) $\boxed{AC = 102.5 \text{ ft}}$



$$\sin 70 = \frac{x}{102.5}$$

$\boxed{x = 96.4\text{FT}}$

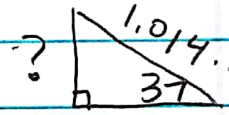
(63)



$$\frac{1.75}{\sin 110} = \frac{a}{\sin 33} = \frac{b}{\sin 37}$$

$$a = \frac{1.75\sin(33)}{\sin 110} \qquad b = \frac{1.75\sin(37)}{\sin 110}$$

$1.014\ldots$ $\qquad 1.120\ldots$



$$\sin 37 = \frac{x}{1.014\ldots}$$

$\boxed{x = 0.61 \text{ mi}}$

(64) $\sqrt{x^2} = \sqrt{900^2 + 225^2 - 2(900)(225)\cos 70}$

$\boxed{x = 849.77 \text{ ft}}$