Review for Exam Two ----- Math 1523 , Spring 2013

5.1 ⟶ Trigonometric Identities

1) Simplify each of the following to a single trigonometric function or a single real number :

a) $\frac{1 - \sin^2 x}{\sin x \cos x}$ b) $\csc x - \csc x \cos^2 x$ c) $\sin^2 x + \tan^2 x + \cos^2 x$

e) $(2 \cos x - 5 \sin x)^2 + (5 \cos x + 2 \sin x)^2$ f) $\left(\frac{\sec x}{\csc x}\right) \times \left(\frac{\cos x}{\sin x}\right)$

2) True or False?

a) $1 - \cos x = \sin x$ b) $\sin(x + y) = \sin x + \sin y$

5.2 ⟶ Sums and Differences

1) If $\sin X = \frac{3}{5}$ and angle X terminates in the second quadrant and $\tan Y = \frac{12}{5}$ and angle Y terminates in the first quadrant, then find the exact value of each of the following:

a) $\cos(X + Y)$ b) $\sin(Y - X)$ c) $\tan(X - Y)$

2) Write each of the following as a single trigonometric function:

a) $\sin x \cos \frac{\pi}{12} - \cos x \sin \frac{\pi}{12}$ b) $\frac{\tan 4 - \tan y}{1 + (\tan 4)(\tan y)}$

3) Expand and simplify: $\sin\left(x - \frac{3\pi}{2}\right)$

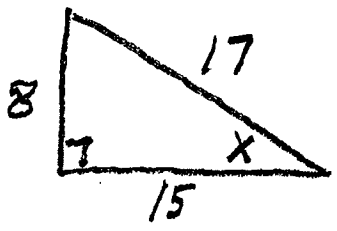
4) Find the exact value of: $\sin\left(\cos^{-1}\left(\frac{5}{13}\right) + \tan^{-1}\left(\frac{15}{8}\right)\right)$

5.3 ⟶ Double and Half angle

1) If $\cos X = \frac{3}{5}$ and angle X terminates in the fourth quadrant and then find the exact value of each of the following:

a) $\sin 2x$ b) $\cos 2x$ c) $\tan \frac{x}{2}$

2) Given the triangle to the right, find the exact value of each of the following:



a) $\sin 2x$ b) $\cos \frac{x}{2}$ c) $\tan 2x$

3) Find the eact value of $\cos\left(2\sin^{-1}\left(\frac{12}{13}\right)\right)$

5.5 ⟶ Trigonometric equations

1) Find the solution set (exact values)for each of the following equations in the interval $0 \leq x \leq 2\pi$:

a) $\cos^2 x = \cos x$ b) $5\sin x - 3 = \sin x - 5$

c) $3\tan^2 x = 1$ d) $2\sin^3 x = \sin x$

e) $\sin^2 x = \cos^2 x$ f) $2\cos 2x = 1$

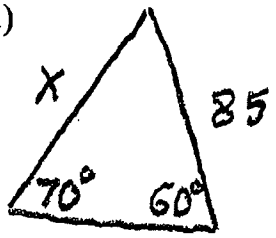
2) Use a calculator to find the solution set for $12 \tan^2 x = 7$

3) Find all solutions for the equation $2 \sin^2 - \sin x = 3$ for $0 \leq x \leq 2\pi$

6.1 ⟶ Law of Sines

1) In each of the following triangles, find the value of X:

a)



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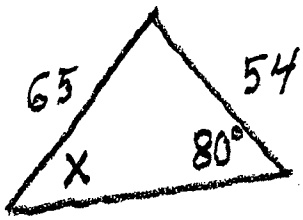

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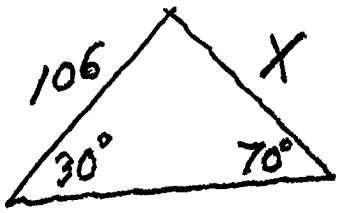
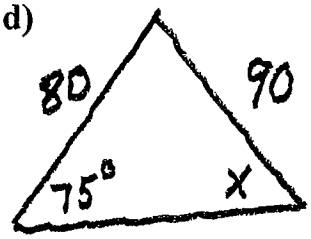


d)



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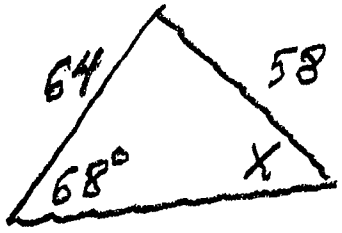
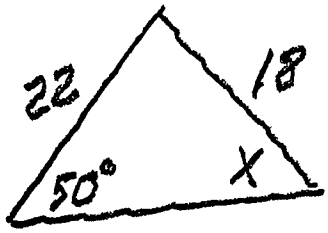


f)

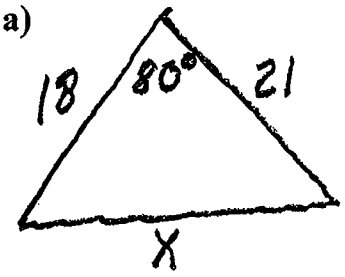


2) Find the area of the triangles in a) and b) and c) above.

6.2 ⟶ Law of Cosines

1) In each of the following triangles, find the value of X:

a)



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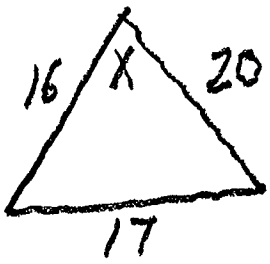

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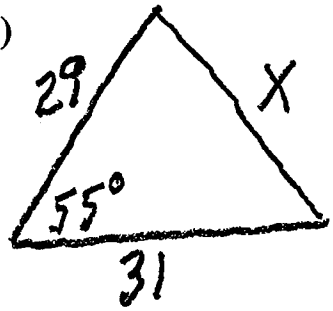

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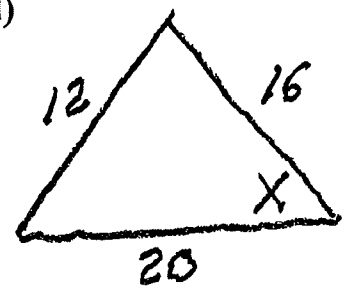

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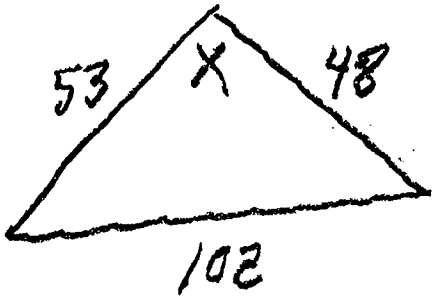
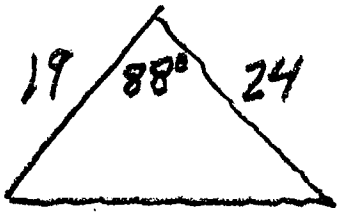


2) Find the area of each of the following triangles:

a)



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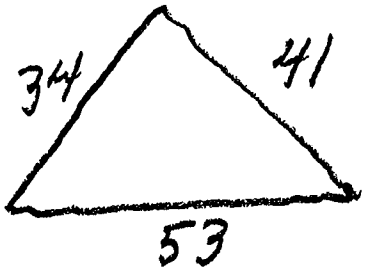

3) Find the area of the figure to the right.