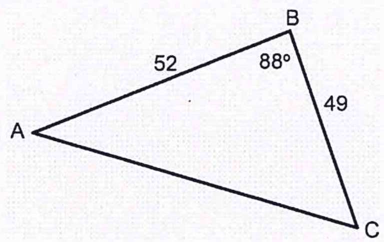
Bellwork Alg 2B Tuesday, June 5, 2018

1. Find the area of $\triangle ABC$ to the nearest tenth where $\angle B = 125°$, $a = 38$, and $c = 20$

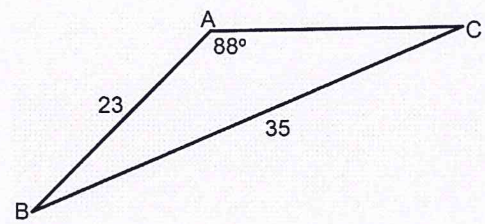
2. State 5 x-intercepts and 5 VA of this function: $\text{Cot}\frac{6x}{11}$

3. Solve each triangle. Give answers to the nearest tenth.

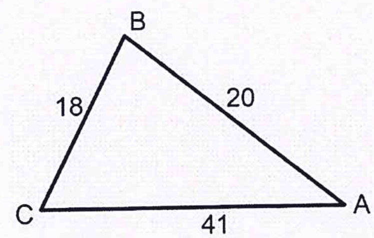
a)



b)



c)



4. Given $\text{Csc}\theta = \frac{9}{7}$ find the remaining trig functions as ratios. Simplify and rationalize denominators.

$\text{Cos}\theta =$ $\text{Tan}\theta =$ $\text{Sec}\theta =$

$\text{Sin}\theta =$ $\text{Cot}\theta =$

5. Find the complete solution. Give EXACT answers if possible otherwise round to the nearest tenth. Give answers in degrees.

$8\text{Cos}^2 6x + 7\text{Cos}6x = 0$

6. Simplify each trig expression.

a) $\text{Sin}^2 x - \text{Cos}^2 x\text{Sin}^2 x$

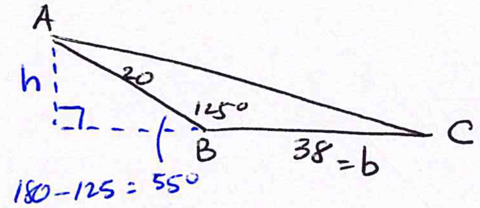
b) $\frac{1}{\text{Sin}x\text{Cos}x} - \frac{1}{\text{Tan}x}$

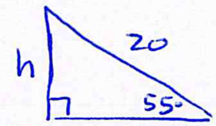
7. verify this trig identity. $\frac{\text{Csc}\theta + \text{Cot}\theta}{\text{Tan}\theta + \text{Sin}\theta} = \text{Cot}\theta\text{Csc}\theta$

ALG 2B Bellwork Tue. 6-5-18

$\boxed{\text{ANSWERS}}$

(1)





$\sin 55° = \frac{h}{20}$

$h = 16.4$

$A = \frac{1}{2}bh = \frac{1}{2}(38)(16.4)$

$\boxed{A = 311.6}$

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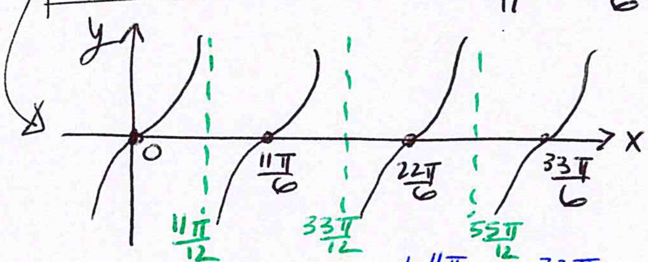
(2) $y = \cot \frac{6x}{11} \longrightarrow \boxed{y = \tan \frac{6x}{11}}$ period $= \frac{\pi}{\frac{6}{11}} = \frac{11\pi}{6} = \frac{22\pi}{12}$

$$\boxed{\begin{array}{l} \underline{\text{X-int}} \quad x = \pm\frac{11\pi}{12}, \pm\frac{33\pi}{12}, \frac{55\pi}{12} \\ \underline{\text{VA}}: \quad x = 0, \pm\frac{11\pi}{6}, \pm\frac{22\pi}{6} \end{array}}$$



X-int: $x = 0, \pm\frac{11\pi}{6}, \pm\frac{22\pi}{6}$

VA: $x = \pm\frac{11\pi}{12}, \pm\frac{33\pi}{12}, \pm\frac{55\pi}{12}$

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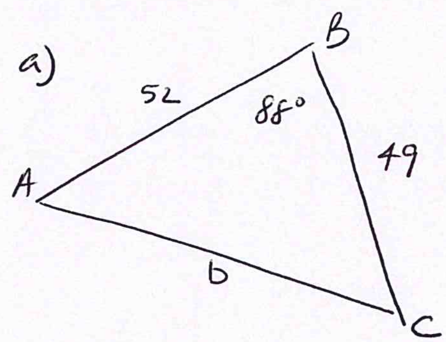
(3) a)



1. side b: Law of Cosines

$b^2 = 52^2 + 49^2 - 2(52)(49)\cos 88$

$\boxed{b = 70.2}$

2. Angle A: Law of Cosines or Law of Sines

$49^2 = 52^2 + 70.2^2 - 2(52)(70.2)\cos A$

$-5231.04 = -7300.8 \cos A$

$A = \cos^{-1}\left(\frac{-5231.04}{-7300.8}\right)$

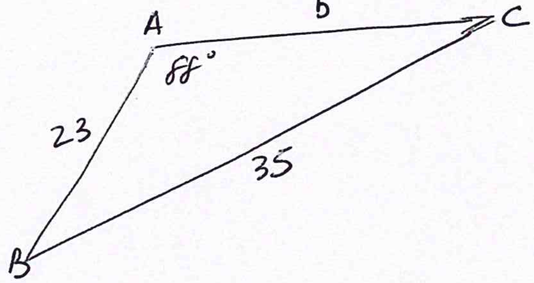
$\boxed{\angle A = 44.2°}$

3. Angle C

$\angle C = 180 - 88 - 44.2$

$\boxed{\angle C = 47.8°}$

(3) b)



1. Angle C   Law of Sines

$$\frac{\sin 88°}{35} = \frac{\sin C}{23}$$

$$C = \sin^{-1}\left(\frac{23 \sin 88}{35}\right)$$

$$\boxed{\angle C = 41.1°} \quad \& \quad \cancel{138.9°}$$

NOT POSSIBLE

2. Angle B

$$\angle B = 180 - 88 - 41.1$$

$$\boxed{\angle B = 50.9°}$$

3. side b   law of Sines or Law of Cosines

$$\frac{\sin 88}{35} = \frac{\sin 50.9}{b}$$

$$\boxed{b = 27.2}$$

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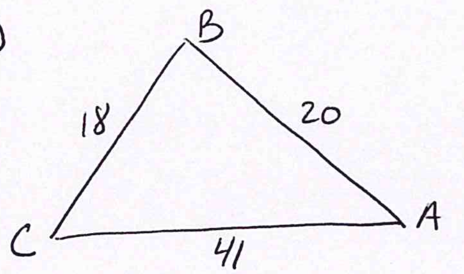
c)



NOT A TRIANGLE

Angle A   Law of Cosines

$$18^2 = 20^2 + 41^2 - 2(20)(41)\cos A$$

$$-1757 = -1640 \cos A$$

$$\cos A = \frac{-1757}{-1640} = 1.07$$

NOT POSSIBLE

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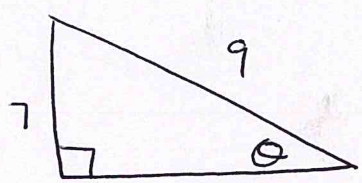
(4) $\csc\theta = \frac{9}{7}$



$$\sqrt{9^2 - 7^2} = \sqrt{32} = 4\sqrt{2}$$

$$\sin\theta = \frac{7}{9}$$

$$\cos\theta = \frac{4\sqrt{2}}{9}$$

$$\tan\theta = \frac{7}{4\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{7\sqrt{2}}{8}$$

$$\cot\theta = \frac{4\sqrt{2}}{7}$$

$$\sec\theta = \frac{9}{4\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{9\sqrt{2}}{8}$$

(5) $8\cos^2 6x + 7\cos 6x = 0$

period of $\cos 6x$
$= \frac{2\pi}{6} = \frac{360}{6} = 60°$

$\cos 6x\,(8\cos 6x + 7) = 0$

$\cos 6x = 0$

$\frac{6x}{6} = \frac{90°}{6}$ & $\frac{270°}{6}$

$x = 15°$ & $45°$

$8\cos 6x + 7 = 0$

$\cos 6x = -7/8$

$6x = \cos^{-1}(-7/8)$

$\frac{6x}{6} = \frac{151.0}{6}$ & -151.0
$\quad +360$
$\frac{208}{6}$

$x = 25.2°$ & $34.8°$

$$\boxed{x = \underbrace{15°, 45°, 25.2°, 34.8°}_{+60°n}}$$

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(6) a) $\sin^2 x - \cos^2 x \sin^2 x$

$= \sin^2 x\,(1 - \cos^2 x)$

$= \sin^2(x) \cdot \sin^2 x = \boxed{\sin^4 x}$

b) $\frac{1}{\sin x \cos x} - \frac{1}{\frac{\sin x}{\cos x}}$

$= \frac{1}{\sin x \cos x} - \frac{\cos x}{\sin x} \cdot \frac{\cos x}{\cos x}$

$= \frac{1}{\sin x \cos x} - \frac{\cos^2 x}{\sin x \cos x}$

$= \frac{1 - \cos^2 x}{\sin x \cos x} = \frac{\sin^2 x}{\sin x \cos x}$

$= \frac{\sin x}{\cos x} = \boxed{\tan x}$

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(7) $\frac{\csc + \cot}{\tan + \sin} = \cot \csc$

$\frac{\cos}{\sin} \cdot \frac{1}{\sin}$

$= \frac{\frac{1}{\sin} + \frac{\cos}{\sin}}{\frac{\sin}{\cos} + \sin \cdot \frac{\cos}{\cos}}$

$= \frac{\frac{1+\cos}{\sin}}{\frac{\sin + \sin\cos}{\cos}}$

$= \frac{1+\cos}{\sin} \cdot \frac{\cos}{\sin + \sin\cos}$

$= \frac{\cancel{1+\cos}}{\sin} \cdot \frac{\cos}{\sin(\cancel{1+\cos})} = \frac{\cos\theta}{\sin^2\theta} = \frac{\cos\theta}{\sin^2\theta}$