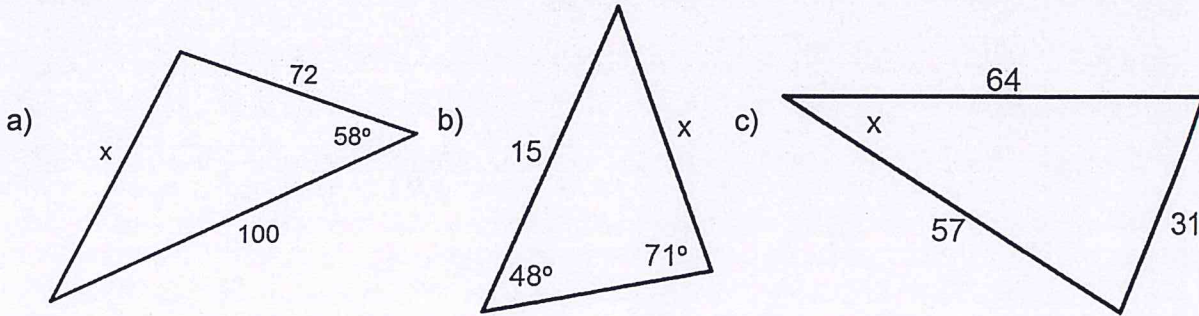


1. State 5 x-intercepts and 5 VA of this function: $\tan \frac{6x}{11}$

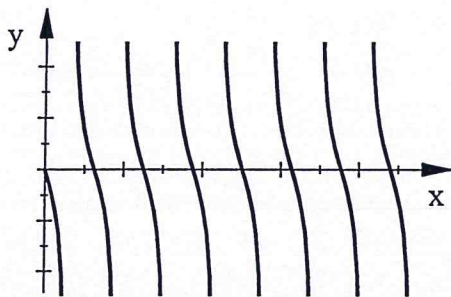
2. Find the value of x in each triangle to the nearest tenth.



3. Given $\csc \theta = \frac{9}{7}$ find the remaining five trig functions as ratios. Simplify and rationalize denominators as necessary.

4. Simplify this trig expression. $\frac{1}{\sin x \cos x} - \frac{1}{\tan x}$

5. Write the equation of this Tangent function. The window is 0 to $\frac{12\pi}{7}$



6. Find the EXACT value of each using the Unit Circle.

a) $\csc(-2040^\circ)$

b) $\cot \frac{19\pi}{3}$

7. Find each to the nearest hundredth.

a) $\sec \frac{11\pi}{21}$

b) $\cot(-311^\circ)$

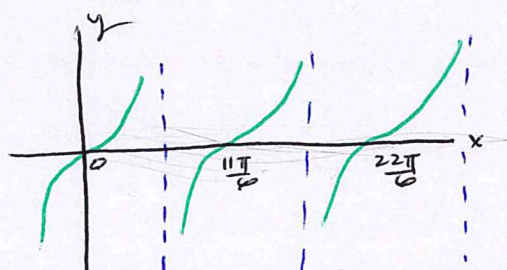
1. State 5 x-intercepts and 5 VA of this function: $\tan \frac{6x}{11}$

ANSWERS

$$\text{period} = \frac{\pi}{\frac{6}{11}} = \frac{11\pi}{6}$$

$$x\text{-INT: } x = 0, \pm \frac{11\pi}{6}, \pm \frac{22\pi}{6}, \dots$$

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

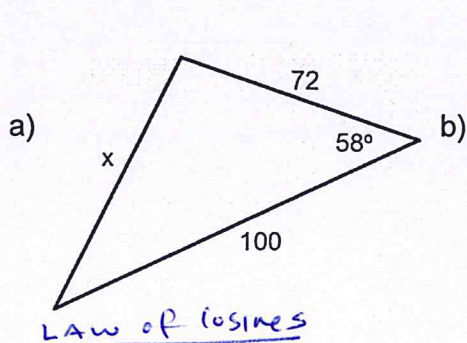


$$\frac{1}{2} \cdot \frac{11\pi}{6} = \frac{11\pi}{12}$$

$$\frac{33\pi}{12} + \frac{22\pi}{12} = \frac{55\pi}{12}$$

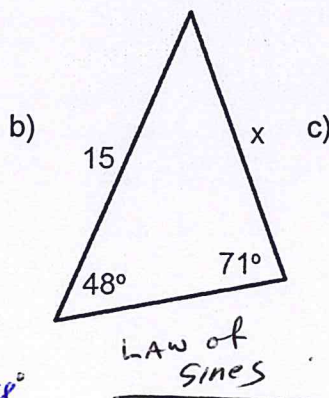
$$\frac{11\pi}{12} + \frac{11\pi}{6} = \frac{11\pi}{12} + \frac{22\pi}{12} = \frac{33\pi}{12}$$

2. Find the value of x in each triangle to the nearest tenth.



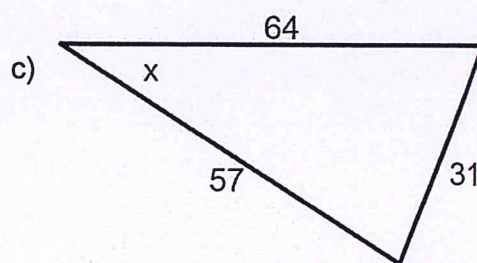
$$x^2 = 72^2 + 100^2 - 2(72)(100)\cos 58^\circ$$

$$x = 86.9$$



$$\frac{\sin 71^\circ}{15} = \frac{\sin 48^\circ}{x}$$

$$x = 11.8$$



Law of Cosines

$$31^2 = 57^2 + 64^2 - 2(57)(64)\cos x$$

$$-6384 = -7296 \cos x$$

$$\cos x = \frac{-6384}{-7296}$$

$$x = \cos^{-1}\left(\frac{-6384}{-7296}\right)$$

$$x = 29.0^\circ$$

3. Given $\csc \theta = \frac{9}{7}$ find the remaining five trig functions as ratios. Simplify and rationalize denominators as necessary.

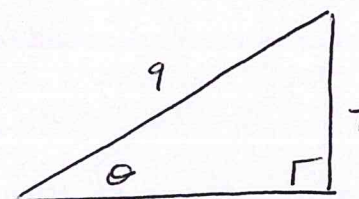
$$\sin \theta = \frac{7}{9}$$

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

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

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

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



$$\sqrt{9^2 - 7^2} = \sqrt{32} = \sqrt{16 \cdot 2} = 4\sqrt{2}$$

4. Simplify this trig expression.

$$\frac{1}{\sin x \cos x} - \frac{1}{\tan x}$$

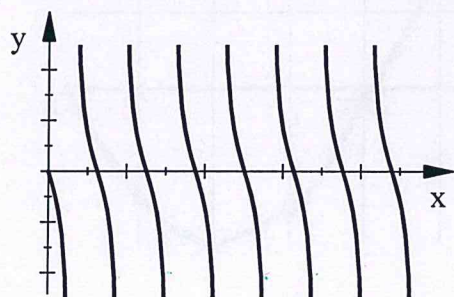
$$= \frac{1}{\sin \cdot \cos} - \cot$$

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

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

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

5. Write the equation of this Tangent function. The window is 0 to $\frac{12\pi}{7}$



7 1/2 cycles
= 15/2 cycles

• Neg Tangent function

$$\text{period} = \frac{\frac{12\pi}{7}}{\frac{15}{2}} = \frac{12\pi}{7} \cdot \frac{2}{15} = \frac{8\pi}{5}$$

$$b = \frac{\pi}{\text{period}} = \frac{\pi}{8\pi/5} = \pi \cdot \frac{5}{8\pi} = \frac{5}{8}$$

$$b = \frac{5}{8}$$

$$y = \boxed{-\tan \frac{5x}{8}}$$

6. Find the EXACT value of each using the Unit Circle.

a) $\csc(-2040^\circ)$ $\frac{-2040^\circ}{+2(1080)}$

$$= \csc(120^\circ)$$

$$= \frac{1}{\sin 120^\circ}$$

$$= \frac{1}{\frac{\sqrt{3}}{2}} = \frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \boxed{\frac{2\sqrt{3}}{3}}$$

b) $\cot \frac{19\pi}{3}$

$$\frac{19\pi}{3} - \frac{6\pi}{3} - \frac{6\pi}{3} - \frac{6\pi}{3} = \frac{\pi}{3}$$

$$= \cot \frac{\pi}{3}$$

$$= \frac{x}{y} \text{ at } \pi/3 = \frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \frac{1}{2} \cdot \frac{2}{\sqrt{3}} = \frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$$

$$= \boxed{\frac{\sqrt{3}}{3}}$$

7. Find each to the nearest hundredth.

a) $\sec \frac{11\pi}{21}$

$$= \frac{1}{\cos \frac{11\pi}{21}}$$

$$= \boxed{-13.38}$$

b) $\cot(-311^\circ)$

$$= \frac{1}{\tan(-311^\circ)}$$

$$= \boxed{0.87}$$