

- Analyze the student's work for each question. If their work is correct, then write "correct". If there is an error or multiple errors, then use complete sentences to explain the error AND how it can be corrected.

1. Simplify the expression: $\csc x \cdot \tan x$

$$\csc x \cdot \tan x = \frac{1}{\sin x} \cdot \frac{\sin x}{\cos x} = \cos x$$

2. Solve for x on $[0, 2\pi)$: $\sin 2x + \sin x = 0$

$$\sin 2x + \sin x = 0$$

$$2\cos x \sin x + \sin x = 0$$

$$\sin x (2\cos x) = 0$$

$$\sin x = 0 \quad 2\cos x = 0$$

$$x = \sin^{-1}(0) \quad x = \cos^{-1}\left(\frac{0}{2}\right)$$

$$x = 0, \pi \quad x = \frac{\pi}{2}, \frac{3\pi}{2}$$

$$(x = 0, \frac{\pi}{2}, \pi, \frac{3\pi}{2})$$

3. Find the exact value of $\cos 75^\circ$

$$\cos 75^\circ = \cos(45^\circ + 30^\circ) = \cos 45^\circ \cos 30^\circ + \sin 45^\circ \sin 30^\circ$$

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

$$= \frac{\sqrt{6}}{4} + \frac{\sqrt{2}}{4} = \frac{\sqrt{6} + \sqrt{2}}{4}$$

4. Simplify the expression: $(1 + \sec x)(1 - \cos x)$

$$(1 + \sec x)(1 - \cos x) = (1 + \sec x) \cdot \sin x$$

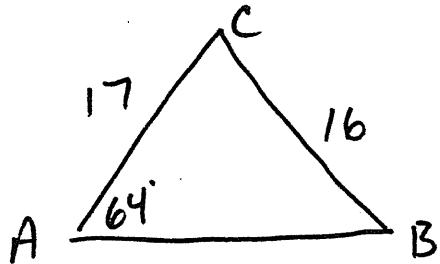
Pythagorean identity!

$$= \sin x + \sec x \cdot \sin x$$

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

$$= \sin x + \tan x$$

5. Given $\angle A = 64^\circ$, $a = 17$, $b = 16$, find the measure of $\angle B$.



$$\frac{\sin 64^\circ}{16} \cancel{\times} \frac{\sin B}{17} \quad \text{cross multiply!}$$

$$\frac{16 \cdot \sin B}{16} = \frac{17 \cdot \sin 64^\circ}{16}$$

$$\sin B = \frac{17 \cdot \sin 64^\circ}{16}$$

$$\angle B = \sin^{-1} \left(\frac{17 \cdot \sin 64^\circ}{16} \right) = 72.74^\circ$$

6. Simplify: $\frac{\sin x}{\cot^2 x} - \frac{\sin x}{\cos^2 x}$

$$\begin{aligned} \frac{\sin x}{\cot^2 x} - \frac{\sin x}{\cos^2 x} &= \frac{\sin x}{\left(\frac{1}{\tan^2 x}\right)} - \frac{\sin x}{\left(\frac{1}{\sec^2 x}\right)} \\ &= \sin x \cdot \tan^2 x - \sin x \cdot \sec^2 x \\ &= \sin x (\tan^2 x - \sec^2 x) \\ &= \sin x (1) \\ &= \sin x \end{aligned}$$

7. Simplify: $\cos x (\tan x + \cot x \cdot \sin x)$

$$\begin{aligned} \cos x (\tan x + \cot x \cdot \sin x) &= \cos x \left(\frac{\sin x}{\cos x} + \frac{\cos x}{\sin x} \cdot \sin x \right) \\ &= \cos x (\overbrace{\sin x + 1}) \\ &= \cos x \sin x + \cos x \end{aligned}$$

KC6 ~ Finding Errors

1. $\frac{1}{\cos x} = \sec x$

2. Incorrect Factoring
 $\sin x(2\cos x + 1) = 0$

3. Incorrect +/- sign
 $= \cos 45^\circ \cos 30^\circ - \sin 45^\circ \sin 30^\circ$

4. Pythagorean identity cannot be used in the situation, since $\cos x$ is not $\cos^2 x$

5. 2 triangles can be formed,
so $m\angle B$ could also equal $180 - 72.74^\circ$

6. $\tan^2 x - \sec^2 x$ equals negative 1,
so solution should be $-\sin x$

7. simplification error over the plus sign (with $\cos x$)