

Review 4-1

Solve the following equations on the interval $0 \leq x < 2\pi$:

1NCl. $\cos x - 1 = 0$

2NCl. $\csc x + 2 = 0$

3NCl. $2\sin(4x) - 1 = 0$

4NCl. $\sin x = \frac{1}{4\sin x}$

5NCl. $\tan(3x) = \sqrt{3}$

6NCl. $8\sin\left(\frac{x}{2}\right) - 8 = 0$

7NCI. $2\cos^2(2x) - 1 = 0$

8NCI. $\sec(3x) = \sqrt{2}$

9NCI. $\sin\left(\theta - \frac{\pi}{4}\right) = -\frac{\sqrt{2}}{2}$

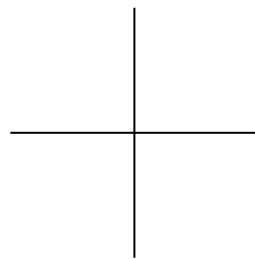
10NCI. $3\tan^2\left(2x - \frac{\pi}{2}\right) - 1 = 0$

11NCI. $2\sin^2 x - 5\sin x = -3$

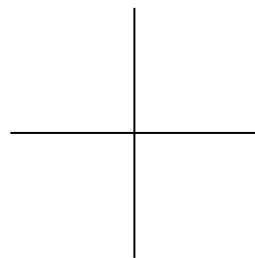
12NCI. $2\cos^3 x + \cos^2 x = 0$

Prove the following:

13NCI. Show that $\cot(-x) = -\cot x$ for $x = \frac{13\pi}{6}$ using the graph to the right:



14NCI. Show that: $\sec(-x) = \sec x$ for $x = \frac{14\pi}{3}$ using the graph to the right:



15NCII. Prove:

$$\frac{1 + \tan x}{\sin x} - \sec x = \csc x$$

16NCI. Prove:

$$\frac{\csc x}{\sin x} - \frac{\cot x}{\tan x} = 1$$

17NCII. Prove:

$$\frac{\sec^2 x}{\cot x} - \tan^3 x = \tan x$$

18NCII. Prove:

$$\frac{\tan^2 x + 1}{\tan^2 x} = \csc^2 x$$

19NCI. Prove:

$$(\sin x + \cos x)^2 + (\sin x - \cos x)^2 = 2$$

20NCII. Prove:

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

21NCI. Prove:

$$\frac{\tan x}{1 + \sec x} + \frac{1 + \sec x}{\tan x} = 2 \csc x$$

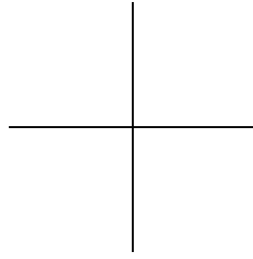
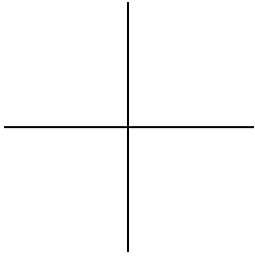
22NCI. Prove:

$$\csc^4 x - 2 \csc^2 x + 1 = \cot^4 x$$

23NCII. Given the following conditions:

$$\tan \alpha = \frac{12}{5} \quad \text{where} \quad \pi < \alpha < \frac{3\pi}{2}$$

$$\cos \beta = \frac{4}{5} \quad \text{where} \quad -\frac{\pi}{2} < \beta < 0$$



find the exact value of:

a) $\sin(\alpha + \beta)$

b) $\cos(\alpha + \beta)$

c) $\sin(\alpha - \beta)$

d) $\cos(\alpha - \beta)$

Find the exact value of each:

24NCII. $\sin 165^\circ$

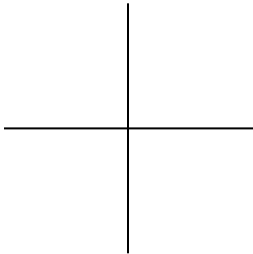
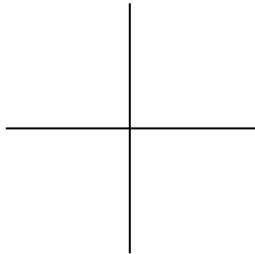
25NCII. $\cos 285^\circ$

26NCII. $\tan\left(\frac{13\pi}{12}\right)$

27NCII. $\sin\left(\frac{29\pi}{12}\right)$

<p>28NCII. $\sin\left(\frac{17\pi}{24}\right)\cos\left(\frac{\pi}{8}\right) + \cos\left(\frac{17\pi}{24}\right)\sin\left(\frac{\pi}{8}\right)$</p>	<p>29NCII. $\frac{\tan 37^\circ - \tan 13^\circ}{1 + \tan 37^\circ \tan 13^\circ}$</p>
<p>30NCII. $\frac{\tan\left(\frac{11\pi}{12}\right) + \tan\left(\frac{5\pi}{12}\right)}{1 - \tan\left(\frac{11\pi}{12}\right)\tan\left(\frac{5\pi}{12}\right)}$</p>	<p>31NCII. $\cos 146^\circ \cos 11^\circ + \sin 146^\circ \sin 11^\circ$</p>

Evaluate each of the following:

<p>32NCII. Given $\tan \theta = \frac{3}{4}$ and $\sin \theta < 0$,</p>  <p>a) find $\cos(2\theta)$</p> <p>b) find $\cos\left(\frac{1}{2}\theta\right)$</p>	<p>33NCII. Given $\cos \alpha = -\frac{5}{13}$ and $\tan \alpha < 0$,</p>  <p>a) find $\sin(2\alpha)$</p> <p>b) find $\sin\left(\frac{1}{2}\alpha\right)$</p>
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