Honors PreCalculus '17-18
Trig Identities Group Test
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Name___________________________________

Score___________

For Problem 1-6, use:

(11, -60) is on the terminal side of Q and
$270° \le Q \le 360°$

$\cos I = {-8}/{17}$ and $-180° \le I \le -90°$; and

$\cot E = {-3}/{4}$ and $270° \le E \le 360°$

to find the exact values of:

1. sin (I-Q)

2. cos 2I

3. $\tan\left(\frac{1}{2}E\right)$

4. csc (I+E)

5. tan 2E

6. $\cos\left(\frac{1}{2}I\right)$

7. Prove: $\tan x \tan\frac{1}{2}x = \sec x - 1$

8. Prove: $\frac{2}{1+\cos x} = 2\csc^2 x - 2\cot x \csc x$

9. Solve for $x \in [-45°,\ 270°)$:

$2\sin(2x-30°)\cos(2x-30°) = -\frac{\sqrt{3}}{2}$

10. Solve for $x \in [0,\ 2\pi)$

$\cos 2x \sin x + \cos 2x \sin x - 2\sin 3x = \frac{1}{2}$

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For Problem 1-6, use:

(11, -60) is on the terminal side of Q and
$270° \le Q \le 360°$

$\cos I = -8/17$ and $-180° \le I \le -90°$; and

$\cot E = -3/4$ and $270° \le E \le 360°$

to find the exact values of:

1. cos (E-Q)

2. sin 2E

3. $\sin\left(\frac{1}{2}I\right)$

4. tan (I+E)

5. cot 2I

6. $\sec\left(\frac{1}{2}I\right)$

7. Prove: $\cot A + \tan A = 2\csc 2A$

9. Prove:
$\sin\left(A + 30°\right) + \cos\left(A + 60°\right) = \cos A$

8. Solve for x:
$-\cos^2 4x = \sin^2 4x - 2\sin\left(4x + \frac{\pi}{2}\right)$

10. Solve for $x \in \left[-\pi,\ \pi\right)$:

$$\frac{\sin x \tan \frac{1}{2}x}{2} - \sin^2 \frac{1}{2}x = 0$$

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For Problem 1-6, use:

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$\cos I = {}^{-8}\!/_{17}$ and $-180° \le I \le -90°$; and

$\cot E = {}^{-3}\!/_{4}$ and $270° \le E \le 360°$

to find the exact values of:

1. tan (I-Q)

2. cot 2Q

3. $\csc\left(\frac{1}{2}E\right)$

4. cos (I+E)

5. csc 2E

6. $\sin\left(\frac{1}{2}Q\right)$

7. Prove: $\dfrac{\cos\frac{1}{2}\theta - \sin\frac{1}{2}\theta}{\cos\frac{1}{2}\theta + \sin\frac{1}{2}\theta} = \dfrac{\cos\theta}{1+\sin\theta}$

[Hint: substitute $u = \frac{1}{2}\theta$ and $2u = \theta$]

8. Prove: $\dfrac{\csc\phi - 6}{\csc\phi - 2} = \dfrac{\cot^2\phi - 4\csc - 11}{\cot^2\phi - 3}$

9. Solve exactly for $x \in (-\pi,\ \pi)$:

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

10. Solve for $x \in (0,\ 2\pi)$

$$\cot\left(x - \frac{\pi}{4}\right) = -3 + 2\cot\left(x - \frac{\pi}{4}\right)$$

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For Problem 1-6, use:

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$\cos I = -8/17$ and $-180° \le I \le -90°$; and

$\cot E = -3/4$ and $270° \le E \le 360°$

to find the exact values of:

1. csc (Q-I)

4. sin (I+E)

2. sin 2I

5. cos 2Q

3. $\cos\left(\frac{1}{2}E\right)$

6. $\cot\left(\frac{1}{2}I\right)$

7. Prove: $\sqrt{2}\cos\left(x-\frac{\pi}{4}\right)=\cos x+\sin x$

9. Prove:
$\left(\tan\frac{1}{2}x\right)(1+\cos x)\frac{\cot x}{\csc x}=\frac{1}{2}\sin 2x$

8. Solve for $x\in\left(\frac{\pi}{2},\ \pi\right)$:
$\cos 3x\sin\frac{\pi}{2}-\cos 3x\ \sin\frac{\pi}{2}+\tan^2 x=\sec^2 x$

10. Solve for $x\in[0°,\ 360°)$: $\sin x\cos x=\frac{1}{2}$

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For Problem 1-6, use:

(-11, 60) is on the terminal side of Q and
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$\cos I = {}^{-8}\!/_{17}$ and $-180° \le I \le -90°$; and

$\cot E = {}^{-3}\!/_{4}$ and $270° \le E \le 360°$

to find the exact values of:

1. cot (Q-I)

2. sec 2Q

3. $\sec\left(\frac{1}{2}Q\right)$

4. sec (Q+E)

5. sin 2I

6. $\tan\left(\frac{1}{2}Q\right)$

7. Prove: $\tan\frac{1}{2}x+\cot\frac{1}{2}x=2\csc x$

8. Prove: $\frac{1+\tan^2 x}{1-\tan^2 x}=\sec 2x$

9. Solve for $x\in[0,\ 2\pi)$:
$-\cos^2 x=\sin^2 x-2\sin(3x+\pi)$

10. Solve for $x\in[-\pi,\ \pi)$

$\sin^2 2x-2\sin x\cos x=2$