Honors Algebra 3-4
Ch. 5 Review Worksheet

Name_____
Period _____

(Do work on separate sheets of paper)

1. Simplify: $\sec x \cos\left(\frac{\pi}{2} - x\right)$

2. Simplify: $\frac{\csc x}{\tan x + \cot x}$

3. Perform the addition and simplify:

$$\frac{\tan x}{\csc x} + \frac{\sin x}{\tan x}$$

4. Simplify: $\frac{\sin^2 x}{\sec^2 x - 1}$

5. Simplify: $\frac{1}{\cot\theta} + \frac{1}{\tan\theta}$

6. Factor and simplify:

$$\sec^2 x \csc^2 x - \sec^2 x - \csc^2 x + 1$$

7. Factor and simplify: $\cot^4 x + 2\cot^2 x + 1$

8. Rewrite the expression so that it is not in fractional form: $\frac{\cos^2 x}{1 - \sin x}$

9. Use the substitution $x = 3\cos\theta$ to write the algebraic expression $\sqrt{9 - x^2}$ as a trigonometric expression involving θ, where $0 < \theta < \frac{\pi}{2}$

10. Verify the identity: $\frac{\sec x - \cos x}{\tan x} = \sin x$

11. Verify the identity: $\frac{\csc x}{\sin x} - \frac{\cot x}{\tan x} = 1$

12. Verify the identity: $\dfrac{1+\tan x}{\sin x}-\sec x=\csc x$

13. Verify the identity: $\sin\left(\dfrac{\pi}{2}-x\right)\cos(-x)=\cos^2 x$

14. Verify the identity: $\dfrac{\cos x}{1-\sin^2 x}=\sec x$

15. Verify the identity: $1+\dfrac{1}{\csc^2 x-1}=\sec^2 x$

16. Find all the solutions in the interval $[0,2\pi)$: $\tan 3t=\sqrt{3}$

17. Find all the solutions in the interval $[0,2\pi)$: $\sec^2 x=\sec x+2$

18. Find all the solutions in the interval $[0,2\pi)$: $\cot^2 x-\tan^2 x=0$

19. Find all the solutions in the interval $[0,2\pi)$: $2\sin x\cos x+\cos x=0$

20. Given $\sin x=\dfrac{3}{10}$ *and* $\cos x=-\dfrac{\sqrt{91}}{10}$, find $\tan x$. (Draw the diagrams)

21. Evaluate: $\sin 105°$. (Use the fact that $105°=60°+45°$)

22. Evaluate: $\tan 165°$. (Use the fact that $165°=210°-45°$)

23. Evaluate: $\cos 285°$. (Use the fact that $285°=330°-45°$)

24. Simplify: $\sin 8x\cos 2x+\cos 8x\sin 2x$ (sum & difference formulas)

25. Given $\sin u=-\dfrac{5}{13}, \pi<u<\dfrac{3\pi}{2}$ *and* $\csc v=\dfrac{\sqrt{10}}{3}, \dfrac{\pi}{2}<v<\pi$, find $\cos(u-v)$.
(Draw the diagrams)

26. Find all solutions in the interval $[0,2\pi)$: $\cos 2x+\sin x=0$