

Chapter 5 Cumulative Worksheet

1. Simplify: $1 - 2\sin^2 x + \sin^4 x$	2. Simplify: $\sec^2 x \tan^2 x + \sec^2 x$
3. Verify the identity: $\frac{\tan \theta}{1 + \sec \theta} + \frac{1 + \sec \theta}{\tan \theta} = 2 \csc \theta$	4. Verify the identity: $\sec^2 y - \cot^2 \left(\frac{\pi}{2} - y \right) = 1$
5. Solve in the interval $[0, 2\pi)$: $2 \sin x \cos x = \cos x$	6. Solve in the interval $[0, 2\pi)$: $\cos x + 1 = \sin x$
7. Solve in the interval $[0, 2\pi)$: $\sin 2x + \cos x = 0$	8. Solve in the interval $[0, 2\pi)$: $2 \cos^2 x + 3 \sin x - 3 = 0$
9. Find $\tan \left(\frac{11\pi}{12} \right)$	10. Find $\tan \left(-\frac{19\pi}{12} \right)$
11. Verify the identity: $\sin(x + y) \sin(x - y) = \sin^2 x - \sin^2 y$	12. Solve in the interval $[0^\circ, 360^\circ)$: $\cos \left(x + \frac{\pi}{6} \right) - \cos \left(x - \frac{\pi}{6} \right) = 1$
13. Use half angle formulas to determine the exact values of sine, cosine, and tangent of 165° .	14. Use half angle formulas to determine the exact values of sine, cosine, and tangent of $\frac{\pi}{12}$.
15. Find the exact value of the trigonometric expression when $\sin u = \frac{5}{13}$ where $\frac{\pi}{2} < u < \pi$ and $\cos v = -\frac{3}{5}$ where $\pi < v < \frac{3\pi}{2}$. a) $\tan(u + v) =$ b) $\sin(u - v) =$	16. Find the exact value of the trigonometric expression when $\cos u = -\frac{2}{3}$ where $\frac{\pi}{2} < u < \pi$. a) $\sin 2u =$ b) $\cos 2u =$ c) $\tan 2u =$
17. Find the exact value of the trigonometric expression when $\tan u = -\frac{5}{12}$ where $\frac{3\pi}{2} < u < 2\pi$. a) $\sin \left(\frac{u}{2} \right) =$ b) $\cos \left(\frac{u}{2} \right) =$ c) $\tan \left(\frac{u}{2} \right) =$	18. Rewrite the expression in terms of the first powers of cosine. a) $\cos^4 x$ b) $\sin^2 x \cos^2 x$