

Find the exact value of the expression using the half angle formulas for # 1 – 10.

You must do your work on a separate piece of paper.

1) $\sin 15^\circ$

2) $\cos 22.5^\circ$

3) $\tan 67.5^\circ$

4) $\cos \frac{7\pi}{12}$

5) $\tan \frac{\pi}{12}$

6) $\sin \frac{5\pi}{8}$

7) $\cos \frac{3\pi}{8}$

8) $\sin 165^\circ$

9) $\sin \frac{5\pi}{12}$

Find the exact values of $\sin \frac{u}{2}$, $\cos \frac{u}{2}$, and $\tan \frac{u}{2}$

10) $\tan u = \frac{3}{4}$, $\pi < u < \frac{3\pi}{2}$

Find the exact values of $\sin 2x$, $\cos 2x$, and $\tan 2x$.

11) $\cos x = -\frac{3}{5}$, $\frac{\pi}{2} < x < \pi$

Simplify as far as possible.

12. $\frac{\sin 2x}{2 \sin x}$

13) $(\sin x + \cos x)^2$

14) $\tan(x - 2\pi)$

15) $\sin\left(x - \frac{\pi}{2}\right)$

Prove:

16) $\cos 2x + \cos x = 2 \cos^2 x + \cos x - 1$

17) $\frac{\cos 2x}{\cos x} = 2 \cos x - \sec x$

Evaluate the expression given that $\sin u = \frac{3}{5}$, $\frac{\pi}{2} < u < \pi$ and $\cos v = \frac{-5}{6}$, $\pi < v < \frac{3\pi}{2}$

18) $\sin(u + v)$

19) $\cos(u - v)$

1. $\frac{\sqrt{2-\sqrt{3}}}{2}$

2. $\frac{\sqrt{2+\sqrt{2}}}{2}$

3. $\sqrt{3+2\sqrt{2}}$

4. $-\frac{\sqrt{2-\sqrt{3}}}{2}$

5. $\sqrt{7-4\sqrt{3}}$

6. $\frac{\sqrt{2+\sqrt{2}}}{2}$

7. $\frac{\sqrt{2-\sqrt{2}}}{2}$

8. $\frac{\sqrt{2+\sqrt{3}}}{2}$

10. $\frac{3\sqrt{10}}{10}; \quad \frac{-\sqrt{10}}{10}; \quad -3$

11. $-24/25 \quad ; \quad -7/25 \quad ; \quad 24/7$

12. $\cos x$

13. $1 + \sin 2x$

14. $\tan x$

15. $-\cos x$

18. $\frac{-15+4\sqrt{11}}{30}$

19. $\frac{20-3\sqrt{11}}{30}$