

Using Fundamental Identities Worksheet

Use the given values to evaluate without using a calculator. Use the Pythagorean identities rather than triangles.

1. Find $\sin \theta$ and $\cos \theta$ if $\tan \theta = \frac{3}{4}$ and $\sin \theta > 0$
2. Find $\sec \theta$ and $\csc \theta$ if $\tan \theta = 3$ and $\cos \theta > 0$.
3. Find $\tan \theta$ and $\cot \theta$ if $\sec \theta = 4$ and $\sin \theta < 0$.
4. Find $\sin \theta$ and $\tan \theta$ if $\cos \theta = 0.8$ and $\tan \theta < 0$.

Use the given values to evaluate (if possible) to find the six trig functions. Use the identities rather than triangles.

5. $\sin x = \frac{1}{2}$, $\cos x = \frac{\sqrt{3}}{2}$

6. $\sin \theta = -\frac{\sqrt{2}}{2}$, $\sec x = \sqrt{2}$

7. $\cot \phi = -3$, $\sin \phi = \frac{\sqrt{10}}{10}$

8. $\cos\left(\frac{\pi}{2} - x\right) = \frac{3}{5}$, $\cos x = \frac{4}{5}$

Match the trig expression with one of the following.

- a) $\sec x$ b) -1 c) $\cot x$ d) 1 e) $-\tan x$ f) $\sin x$

9. $\sec x \cos x$

10. $\tan x \csc x$

11. $\cot^2 x - \csc^2 x$

12. $(1 - \cos^2 x)(\csc x)$

13. $\frac{\sin(-x)}{\cos(-x)}$

14. $\frac{\sin\left(\frac{\pi}{2} - x\right)}{\cos\left(\frac{\pi}{2} - x\right)}$

Use basic identities to simplify the expression.

15. $\tan x \cos x$

16. $\sec y \sin\left(\frac{\pi}{2} - y\right)$

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

18. $\frac{1 - \cos^2 \theta}{\sin \theta}$

19. $\cos x - \cos^2 x$

20. $\frac{\sin^2 u + \tan^2 u + \cos^2 u}{\sec u}$

Factor the expression and use the fundamental identities to simplify.

21. $\tan^2 x - \tan^2 x \sin^2 x$

22. $\frac{\sec^2 x - 1}{\sec x - 1}$

23. $\tan^4 x + 2 \tan^2 x + 1$

Perform the addition or subtractions and use the fundamental identities to simplify.

24. $\frac{1}{1 + \cos x} + \frac{1}{1 - \cos x}$

25. $\frac{\cos x}{1 + \sin x} + \frac{1 + \sin x}{\cos x}$