5-1 Trigonometric Identities

Find the value of each expression using the given information.

1. If $\cot \theta = \frac{5}{7}$, find $\tan \theta$.

ANSWER:

$\frac{7}{5}$

2. If $\cos x = \frac{2}{3}$, find $\sec x$.

ANSWER:

$\frac{3}{2}$

3. If $\tan \alpha = \frac{1}{5}$, find $\cot \alpha$.

ANSWER:

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4. If $\sin \beta = -\frac{5}{6}$, find $\csc \beta$.

ANSWER:

$-\frac{6}{5}$

5. If $\cos x = \frac{1}{6}$ and $\sin x = \frac{\sqrt{35}}{6}$, find $\cot x$.

ANSWER:

$\frac{\sqrt{35}}{35}$

6. If $\sec \varphi = 2$ and $\tan \varphi = \sqrt{3}$, find $\sin \varphi$.

ANSWER:

$\frac{\sqrt{3}}{2}$

7. If csc $\alpha = \frac{7}{3}$ and cot $\alpha = \frac{2\sqrt{10}}{3}$, find sec α.

ANSWER:

$\frac{7\sqrt{10}}{20}$

8. If sec $\theta = 8$ and tan $\theta = 3\sqrt{7}$, find csc θ.

ANSWER:

$\frac{8\sqrt{7}}{21}$

Find the value of each expression using the given information.

9. sec θ and cos θ; tan $\theta = -5$, cos $\theta > 0$

ANSWER:

sec $\theta = \sqrt{26}$, cos $\theta = \frac{1}{\sqrt{26}}$ or $\frac{\sqrt{26}}{26}$

10. cot θ and sec θ; sin $\theta = \frac{1}{3}$, tan $\theta < 0$

ANSWER:

cot $\theta = -2\sqrt{2}$, sec $\theta = -\frac{3\sqrt{2}}{4}$

11. tan θ and sin θ; sec $\theta = 4$, sin $\theta > 0$

ANSWER:

tan $\theta = \sqrt{15}$, sin $\theta = \frac{\sqrt{15}}{4}$

12. sin θ and cot θ; cos $\theta = \frac{2}{5}$, sin $\theta < 0$

ANSWER:

sin $\theta = -\frac{\sqrt{21}}{5}$, cot $\theta = -\frac{2}{\sqrt{21}}$ or $-\frac{2\sqrt{21}}{21}$

13. $\cos\theta$ and $\tan\theta$; $\csc\theta = \frac{8}{3}$, $\tan\theta > 0$

ANSWER:

$\tan\theta = \frac{3}{\sqrt{55}}$ or $\frac{3\sqrt{55}}{55}$, $\cos\theta = \frac{\sqrt{55}}{8}$

14. $\sin\theta$ and $\cos\theta$; $\cot\theta = 8$, $\csc\theta < 0$

ANSWER:

$\sin\theta = -\frac{1}{\sqrt{65}}$ or $-\frac{\sqrt{65}}{65}$, $\cos\theta = -\frac{8}{\sqrt{65}}$ or $-\frac{8\sqrt{65}}{65}$

15. $\cot\theta$ and $\sin\theta$; $\sec\theta = -\frac{9}{2}$, $\sin\theta > 0$

ANSWER:

$\cot\theta = -\frac{2}{\sqrt{77}}$ or $-\frac{2\sqrt{77}}{77}$, $\sin\theta = \frac{\sqrt{77}}{9}$

16. $\tan\theta$ and $\csc\theta$; $\cos\theta = -\frac{1}{4}$, $\sin\theta < 0$

ANSWER:

$\tan\theta = \sqrt{15}$, $\csc\theta = -\frac{4}{\sqrt{15}}$ or $-\frac{4\sqrt{15}}{15}$