

Advanced Algebra/Trig

6.1 - 6.2 Review

Name _____

Date _____

1. If $\cos \theta = -\frac{2}{5}$ and θ lies in quadrant II, find $\csc \theta$.

2. If $\tan \beta = 3$ and β lies in quadrant I, find $\sec \beta$.

3. If $\sin \theta = \frac{2}{3}$ and θ lies in quadrant II, find $\cos \theta$.

4. If $\cot \theta = -2$ and θ lies in quadrant IV, find $\cos \theta$.

Simplify.

5. $\sin^2 \theta + \cos^2 \theta + \tan^2 \theta$

6. $\sin \theta \csc \theta + \tan \theta \cot \theta$

7. $\tan^2 \theta \cdot \cos^2 \theta$

8. $\frac{\cos^2 \theta + \sin^2 \theta}{\sin^2 \theta}$

9. $\csc \theta - \cos \theta \cot \theta$

10. $\cot \theta \tan \theta - \sec \theta \cos \theta$

11. $(1 + \cos \theta)(\csc \theta - \cot \theta)$

12. $(1 - \sin \theta)(\sec \theta + \tan \theta)$

Verify each identity.

$$13. \sin \theta \cot \theta \sec \theta = 1$$

$$14. \frac{\sin \theta}{1 - \cos^2 \theta} = \csc \theta$$

$$15. \frac{1}{\sin^2 \theta} - \frac{1}{\tan^2 \theta} = 1$$

$$16. \cos^2 \theta \tan^2 \theta + \sin^2 \theta \cot^2 \theta = 1$$

$$17. \sin \theta (1 + \cot^2 \theta) = \csc \theta$$

$$18. \frac{\cot \theta}{1 + \cot^2 \theta} = \cos \theta \sin \theta$$

$$19. \tan \theta \sin \theta + \cos \theta = \sec \theta$$

$$20. \frac{\tan^2 \theta}{\sec \theta + 1} = \frac{1 - \cos \theta}{\cos \theta}$$

Omit

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1. If $\cos \theta = -\frac{2}{5}$ and θ lies in quadrant II, find $\csc \theta$.

$$\sin^2 \theta + \cos^2 \theta = 1$$

$$\sin^2 \theta + \frac{4}{25} = 1$$

$$\sin^2 \theta = \frac{21}{25}$$

$$\sin \theta = \pm \frac{\sqrt{21}}{5}$$

$\csc \theta = \frac{\pm 5\sqrt{21}}{21}$

2. If $\tan \beta = 3$ and β lies in quadrant I, find $\sec \beta$.

$$\tan^2 \beta + 1 = \sec^2 \beta$$

$$9 + 1 = \sec^2 \beta$$

$$\sqrt{10} = \sec \beta$$

3. If $\sin \theta = \frac{2}{3}$ and θ lies in quadrant II, find $\cos \theta$.

$$\frac{4}{9} + \cos^2 \theta = 1$$

$$\cos^2 \theta = \frac{5}{9}$$

$$\cos \theta = \pm \frac{\sqrt{5}}{3}$$

4. If $\cot \theta = -2$ and θ lies in quadrant IV, find $\cos \theta$.

$$1 + \cot^2 \theta = \csc^2 \theta$$

$$1 + 4 = \csc^2 \theta$$

$$\sqrt{5} = \csc \theta$$

$$\cos \theta = \frac{1}{\sqrt{5}}$$

$\cos \theta = \frac{2\sqrt{5}}{5}$

Simplify.

5. $\sin^2 \theta + \cos^2 \theta + \tan^2 \theta$

$$1 + \tan^2 \theta$$

$$\sec^2 \theta$$

6. $\sin \theta \csc \theta + \tan \theta \cot \theta$

$$1 + 1$$

$$2$$

7. $\tan^2 \theta \cdot \cos^2 \theta$

$$\frac{\sin^2 \theta}{\cos^2 \theta} \cdot \cos^2 \theta$$

$$\sin^2 \theta$$

8. $\frac{\cos^2 \theta + \sin^2 \theta}{\sin^2 \theta} = \frac{1}{\sin^2 \theta} = \csc^2 \theta$

9. $\csc \theta - \cos \theta \cot \theta$

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

$$\frac{\sin^2 \theta}{\sin \theta} = \sin \theta$$

10. $\cot \theta \tan \theta - \sec \theta \cos \theta$

$$1 - 1 = 0$$

11. $(1 + \cos \theta)(\csc \theta - \cot \theta)$

$$\csc \theta - \cot \theta + \csc \theta \cos \theta - \cot \theta \cos \theta$$

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

$$\frac{\sin^2 \theta}{\sin \theta} = \sin \theta$$

12. $(1 - \sin \theta)(\sec \theta + \tan \theta)$

$$\cos \theta$$

Verify each identity.

13. $\sin \theta \cot \theta \sec \theta = 1$

$$\frac{\cancel{\sin \theta} \cdot \cancel{\cos \theta} \cdot \frac{1}{\cancel{\sin \theta}}}{\cancel{\cos \theta}}$$

$$1 = 1$$

14. $\frac{\sin \theta}{1 - \cos^2 \theta} = \csc \theta$

$$\frac{\sin \theta}{\sin^2 \theta} \cdot \frac{1}{\sin \theta} = \csc \theta$$

15. $\frac{1}{\sin^2 \theta} - \frac{1}{\tan^2 \theta} = 1$

$$\csc^2 \theta - \cot^2 \theta = 1$$

16. $\cos^2 \theta \tan^2 \theta + \sin^2 \theta \cot^2 \theta = 1$

$$\cos^2 \theta \frac{\sin^2 \theta}{\cos^2 \theta} + \sin^2 \theta \frac{\cos^2 \theta}{\sin^2 \theta} = 1$$

$$\sin^2 \theta + \cos^2 \theta = 1$$

17. $\sin \theta (1 + \cot^2 \theta) = \csc \theta$

$$\sin \theta \csc^2 \theta$$

$$\frac{\sin \theta \cdot 1}{\sin^2 \theta} = \frac{1}{\sin \theta}$$

$$\csc \theta$$

19. $\tan \theta \sin \theta + \cos \theta = \sec \theta$

$$\frac{\sin^2 \theta}{\cos \theta} + \frac{\cos^2 \theta}{\cos \theta}$$

$$\frac{1}{\cos \theta}$$

$$\sec \theta$$

18. $\frac{\cot \theta}{1 + \cot^2 \theta} = \cos \theta \sin \theta$

$$\frac{\cot \theta}{\csc^2 \theta} = \frac{\cos \theta / \sin \theta}{1 / \sin^2 \theta}$$

$$\frac{\cos \theta \sin \theta}{1} = \cos \theta \sin \theta$$

$$\cos \theta \sin \theta$$

20. $\frac{\tan^2 \theta}{\sec \theta + 1} = \frac{1 - \cos \theta}{\cos \theta}$

$$\frac{\sec^2 \theta - 1}{\sec \theta + 1} = \frac{1 - \cos \theta}{\cos \theta}$$

~~(1 + sec)(1 - sec)~~
~~sec + 1~~
 omit