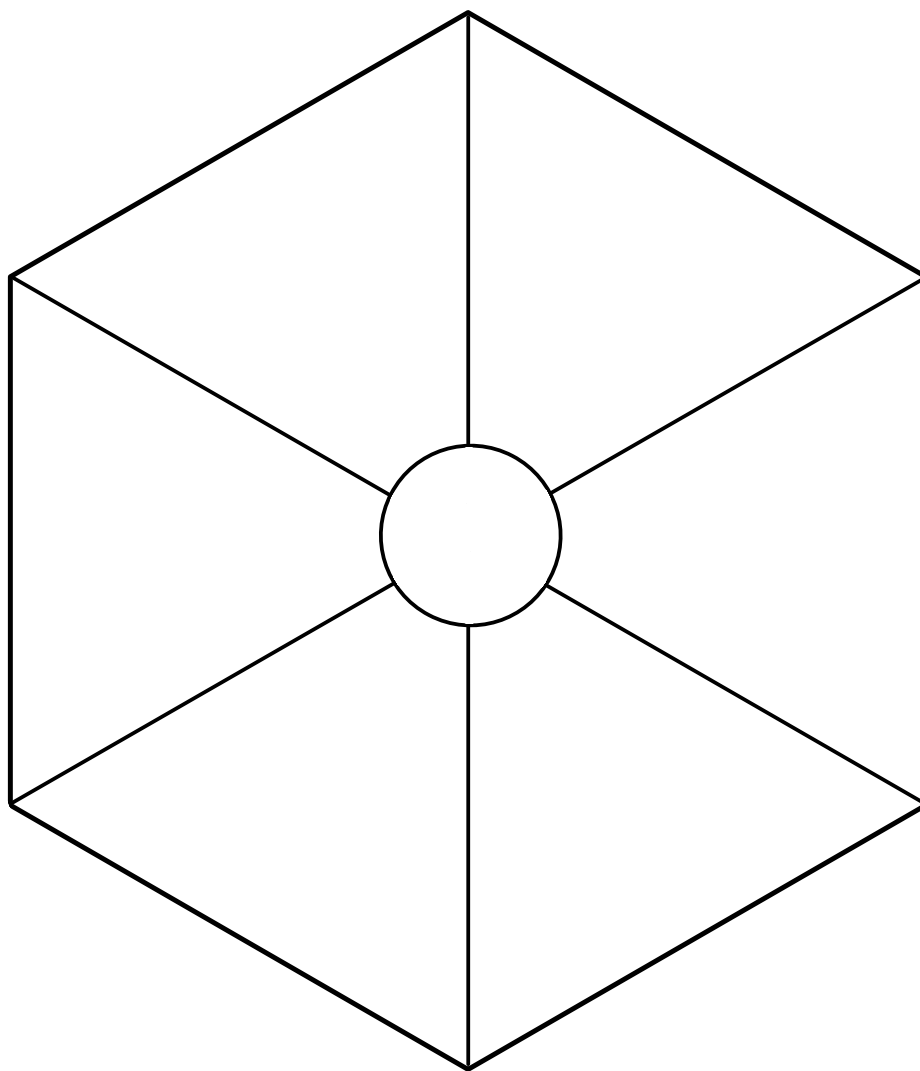


The Magic Hexagon of Trig



Trig Identities worksheet 3.4 name:

Prove each identity:

1. $\sec x - \tan x \sin x = \frac{1}{\sec x}$

2. $\frac{1 + \cos x}{\sin x} = \csc x + \cot x$

3. $\frac{\sec \theta \sin \theta}{\tan \theta + \cot \theta} = \sin^2 \theta$

4. $\frac{\sec \theta}{\cos \theta} - \frac{\tan \theta}{\cot \theta} = 1$

5. $\cos^2 y - \sin^2 y = 1 - 2\sin^2 y$

6. $\csc^2 \theta \tan^2 \theta - 1 = \tan^2 \theta$

7. $\frac{\sec^2 \theta}{\sec^2 \theta - 1} = \csc^2 \theta$

8. $\tan^2 x \sin^2 x = \tan^2 x - \sin^2 x$

$$9. (\sin \theta + \cos \theta)^2 + (\sin \theta - \cos \theta)^2 = 2$$

$$10. (\sin \theta + \cos \theta)(\tan \theta + \cot \theta) = \sec \theta + \csc \theta$$

$$11. \frac{\tan \theta - 1}{\tan \theta + 1} = \frac{1 - \cot \theta}{1 + \cot \theta}$$

$$12. \frac{1 - \tan^2 x}{1 + \tan^2 x} = 1 - 2 \sin^2 x$$

$$13. \frac{\cos x + 1}{\sin^3 x} = \frac{\csc x}{1 - \cos x}$$

$$14. \csc^4 x - \cot^4 x = \csc^2 x + \cot^2 x$$

$$15. \frac{\tan \theta}{\sec \theta} + \frac{\cot \theta}{\csc \theta} = \sin \theta + \cos \theta$$

$$16. \frac{\sin y + \tan y}{1 + \sec y} = \sin y$$

Angle Sum/Difference Identities

Date _____ Period _____

Use the angle sum identity to find the exact value of each.

1) $\cos 105^\circ$

2) $\sin 195^\circ$

3) $\cos 195^\circ$

4) $\cos 165^\circ$

5) $\cos 285^\circ$

6) $\cos 255^\circ$

7) $\sin 105^\circ$

8) $\sin 285^\circ$

9) $\cos 75^\circ$

10) $\sin 255^\circ$

Use the angle difference identity to find the exact value of each.

11) $\cos 75^\circ$

12) $\cos -15^\circ$

13) $\tan 75^\circ$

14) $\cos 15^\circ$

15) $\tan -105^\circ$

16) $\sin 105^\circ$

17) $\tan 15^\circ$

18) $\sin 15^\circ$

19) $\tan -15^\circ$

20) $\sin -75^\circ$

Use the angle sum or difference identity to find the exact value of each.

21) $\sin -105^\circ$

22) $\cos 195^\circ$

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

24) $\tan \frac{13\pi}{12}$

25) $\sin \frac{\pi}{12}$

26) $\cos -\frac{7\pi}{12}$