

Name _____

Date _____ Hour _____

Find the exact value.

Angle measurement	$\cos x$	$\sin x$	$\tan x$
1. 30°	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{3}$
2. 45°	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1
3. 60°	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\sqrt{3}$
4. 90°	0	1	Undefined
5. 120°	$-\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$-\sqrt{3}$
6. 135°	$-\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	-1
7. 150°	$-\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$-\frac{\sqrt{3}}{3}$
8. 180°	-1	0	0

Angle Measurement	$\cos x$	$\sin x$	$\tan x$
9. $\frac{\pi}{6}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{3}$
10. $\frac{\pi}{4}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1
11. $\frac{\pi}{3}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\sqrt{3}$
12. $\frac{\pi}{2}$	0	1	Undefined
13. $\frac{2\pi}{3}$	$-\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$-\sqrt{3}$
14. $\frac{3\pi}{4}$	$-\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	-1
15. $\frac{5\pi}{6}$	$-\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$-\frac{\sqrt{3}}{3}$
16. π	-1	0	0

Rewrite the angle measure below as the sum or difference of any 2 angles in degrees from above.

Example: $15^\circ = 60^\circ - 45^\circ$ or $45^\circ - 30^\circ$

17. 75° $120 - 45$, $45 + 30$ $150 - 30$
18. 165°
19. 120° $60 + 60$ $90 + 30$ $180 - 60$
20. 195°
21. 105° $135 - 30$ $60 -$
22. -75°

$135 + 30$ $120 + 45$

$60 + 135$, $150 + 45$

$-120 + 45$

Rewrite the angle measure below as the sum or difference of any 2 angles in radians from above.

Example: $\frac{\pi}{12} = \frac{\pi}{3} - \frac{\pi}{4}$ or $\frac{\pi}{4} - \frac{\pi}{6}$

23. $\frac{7\pi}{12}$ $\frac{3\pi}{4} - \frac{\pi}{6}$, $\frac{\pi}{3} + \frac{\pi}{4}$
24. $\frac{\pi}{12}$
25. $\frac{5\pi}{12}$ $\frac{2\pi}{3} - \frac{\pi}{4}$ $\frac{\pi}{6} + \frac{\pi}{4}$
26. $\frac{11\pi}{12}$

$\frac{\pi}{3} - \frac{\pi}{4}$ or $\frac{\pi}{4} - \frac{\pi}{6}$

$\frac{3\pi}{4} + \frac{\pi}{6}$, $\frac{2\pi}{3} + \frac{\pi}{4}$

Flip over for 2 verifying problems!!!

Verify each identity, show all work and give reasons for each step.

$$27) \quad \frac{-1}{\tan \theta - \sec \theta} = \frac{1 + \sin \theta}{\cos \theta}$$

Statement	Reason
1. $\frac{-1(\tan \theta + \sec \theta)}{\tan^2 \theta - \sec^2 \theta}$	1. Multiply by conjugate
2. $\frac{-1(\tan \theta + \sec \theta)}{-1}$	2. Pythagorean Identity
3. $\tan \theta + \sec \theta$	3. Cancel common factors (divide)
4. $\frac{\sin \theta}{\cos \theta} + \frac{1}{\cos \theta}$	4. Reciprocal/Quotient Identities
5. $\frac{\sin \theta + 1}{\cos \theta} = \frac{1 + \sin \theta}{\cos \theta}$	5. Add Fractions
1. $\frac{-1}{\frac{\sin \theta}{\cos \theta} - \frac{1}{\cos \theta}}$	1. Reciprocal/Quotient Identities
2. $\frac{-1}{\frac{\sin \theta - 1}{\cos \theta}}$	2. Subtract fractions
3. $\frac{-1 \cos \theta}{\sin \theta - 1}$	3. Divide
4. $\frac{-1 \cos \theta (\sin \theta + 1)}{\sin^2 \theta - 1}$	4. Multiply by 1 ($\sin \theta + 1 / \sin \theta + 1$)
5. $\frac{-1 \cos \theta (\sin \theta + 1)}{-\cos^2 \theta}$	5. Pythagorean Identity
6. $\frac{\sin \theta + 1}{\cos \theta} = \frac{1 + \sin \theta}{\cos \theta}$	6. Cancel common factors (divide)

$$28) \quad \sec^2 x + \tan^2 x \sec^2 x = \sec^4 x$$

Statement	Reason
1. $\sec^2 x (1 + \tan^2 x)$	1. Factor (GCF)
2. $\sec^2 x (\sec^2 x)$	2. Pythagorean Identity
3. $\sec^4 x = \sec^4 x$	3. Multiply

