



## Trigonometry Identities - Pythagorean Problem Tan to Sec (with Identity, Quadrant as Radians)

1 Using:  
 $\tan^2(\beta) = \sec^2(\beta) - 1$  Solve for secant from tangent using trig identities  
 $0 < \beta < \frac{\pi}{2}$

—	A	B
Solve: $\tan(\beta) = 14$ $\sec(\beta) = ?$	$\sec(\beta) = \sqrt{197}$	$\sec(\beta) = \sqrt{137}$

2 Using:  
 $\tan^2(\beta) = \sec^2(\beta) - 1$  Solve for secant from tangent using trig identities  
 $\pi < \beta < \frac{3\pi}{2}$

—	A	B
Solve: $\tan(\beta) = 5$ $\sec(\beta) = ?$	$\sec(\beta) = -\sqrt{26}$	$\sec(\beta) = -\frac{\sqrt{26}}{\sqrt{5}}$

3 Using:  
 $\tan^2(\beta) = \sec^2(\beta) - 1$  Solve for secant from tangent using trig identities  
 $\pi < \beta < \frac{3\pi}{2}$

—	A	B
Solve: $\tan(\beta) = 6$ $\sec(\beta) = ?$	$\sec(\beta) = -\sqrt{10}$	$\sec(\beta) = -\sqrt{37}$

4 Using:  
 $\tan^2(\theta) = \sec^2(\theta) - 1$  Solve for secant from tangent using trig identities  
 $\pi < \theta < \frac{3\pi}{2}$

—	A	B
Solve: $\tan(\theta) = 1$ $\sec(\theta) = ?$	$\sec(\theta) = -\sqrt{2}$	$\sec(\theta) = -\frac{\sqrt{2}}{2}$

5 Using:  
 $\tan^2(\gamma) = \sec^2(\gamma) - 1$  Solve for secant from tangent using trig identities  
 $0 < \gamma < \frac{\pi}{2}$

—	A	B
Solve: $\tan(\gamma) = 15$ $\sec(\gamma) = ?$	$\sec(\gamma) = 17$	$\sec(\gamma) = \sqrt{226}$

6 Using:  
 $\tan^2(\theta) = \sec^2(\theta) - 1$  Solve for secant from tangent using trig identities  
 $\pi < \theta < \frac{3\pi}{2}$

—	A	B
Solve: $\tan(\theta) = 8$ $\sec(\theta) = ?$	$\sec(\theta) = -\sqrt{65}$	$\sec(\theta) = -\frac{\sqrt{65}}{\sqrt{6}}$

7 Using:  
 $\tan^2(\alpha) = \sec^2(\alpha) - 1$  Solve for secant from tangent using trig identities  
 $\frac{\pi}{2} < \alpha < \pi$

—	A	B
Solve: $\tan(\alpha) = -1$ $\sec(\alpha) = ?$	$\sec(\alpha) = -\sqrt{2}$	$\sec(\alpha) = -\frac{\sqrt{2}}{\sqrt{5}}$

8 Using:  
 $\tan^2(\theta) = \sec^2(\theta) - 1$  Solve for secant from tangent using trig identities  
 $0 < \theta < \frac{\pi}{2}$

—	A	B
Solve: $\tan(\theta) = 13$ $\sec(\theta) = ?$	$\sec(\theta) = \sqrt{170}$	$\sec(\theta) = 6\sqrt{5}$