

Chapter Test

T1. $\cos^2 x + \sin^2 x = 1$

T2. $\tan x = \frac{\sin x}{\cos x}$

T3. $\cot x = \frac{1}{\tan x}$

T4. $\sec x = \frac{1}{\cos x}$

T5. $\theta = 30^\circ + 360n^\circ$ or $150^\circ + 360n^\circ$

T6. $x = \frac{\pi}{3} + \pi n$

T7. Both $y = \cos^{-1} x$ and $y = \sin^{-1} x$ must be functions, centrally located near the origin, and continuous on their domains. In order for $y = \sin^{-1} x$ to use the entire domain of arcsine, this is the only range. For $y = \cos^{-1} x$, either $[-\pi, 0]$ or $[0, \pi]$ could be the domain to use the entire domain of arccosine, but positive values are chosen when there is a choice. These are called the principal branches of the inverse relations.

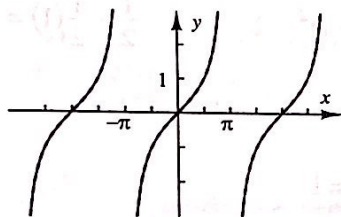
T8. In Quadrant I, opposite = 2,
adjacent = 1, hypotenuse = $\sqrt{5}$, so
 $\cos(\tan^{-1} 2) = \frac{\text{adj}}{\text{hyp}} = \frac{1}{\sqrt{5}} = \frac{\sqrt{5}}{5} = 0.4472$

T9. $(1 + \sin A)(1 - \sin A) = 1 - \sin^2 A = \cos^2 A$ for all real A

T10. $\tan B + \cot B = \frac{\sin B}{\cos B} + \frac{\cos B}{\sin B}$
 $= \frac{\sin^2 B}{\sin B \cos B} + \frac{\cos^2 B}{\sin B \cos B}$
 $= \frac{\sin^2 B + \cos^2 B}{\sin B \cos B} = \frac{1}{\sin B \cos B}$
 $= \frac{1}{\sin B} \cdot \frac{1}{\cos B} = \csc B \sec B$

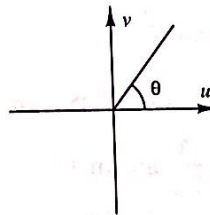
T11. $\frac{\sin C}{1 + \cos C} \cdot \frac{1 - \cos C}{1 - \cos C}$
 $= \frac{\sin C(1 - \cos C)}{(1 + \cos C)(1 - \cos C)}$
 $= \frac{\sin C(1 - \cos C)}{1 - \cos^2 C} = \frac{\sin C(1 - \cos C)}{\sin^2 C}$
 $= \frac{1 - \cos C}{\sin C}$

T12.

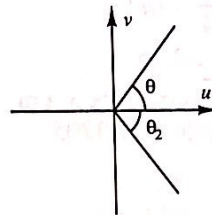


$C \neq n\pi$

T13. $\theta = \cos^{-1} 0.6 = 53.1301\dots^\circ$



T14. $\theta_2 = \cos^{-1} 0.6 = 306.8698\dots^\circ$



T15. $\theta = 53.1301\dots^\circ + 360n^\circ$
 or $306.8698\dots^\circ + 360n^\circ$;
 $\theta = \pm 53.1301\dots^\circ + 360n^\circ$

T16. $\theta = 773.1301\dots^\circ$, roughly $2\frac{1}{6}$ turns

~~T17.~~ $4 \tan(\theta - 25^\circ) = 7 \Rightarrow \theta - 25^\circ = \arctan \frac{7}{4}$
 $\Rightarrow \theta - 25^\circ = 60.26^\circ + 180n^\circ$
 $\Rightarrow \theta = 85.26^\circ + 180n^\circ$

T18. $x = -3 + 7 \cos t$, $y = 2 + 4 \sin t$, $0 \leq t \leq 2\pi$

T19. $x = \tan t$, $y = t$, $-7 \leq t \leq 7$ (or whatever are the y-limits of your graph)

T20. Answers will vary.