

## ***Inverse Functions***

1. a, f; b, e; c, d
2. a.  $30^\circ$  b.  $0^\circ$  c.  $45^\circ$  d.  $-45^\circ$  e.  $150^\circ$  f.  $-90^\circ$
3. Because the range of arcsine is  $-90^\circ$  to  $90^\circ$  inclusive; the range of arccosine is  $0^\circ$  to  $180^\circ$  inclusive and the range of arctangent is  $-90^\circ$  to  $90^\circ$ .
4. a. D:  $(-\infty, -1] \cup [1, \infty)$ ; R:  $[0, \pi/2) \cup (\pi/2, \pi]$   
b. D:  $(-\infty, -1] \cup [1, \infty)$ ; R:  $[-\pi/2, 0) \cup (0, \pi/2]$   
c. D: all real numbers; R:  $[-\pi/2, 0) \cup (0, \pi/2]$ (as graphed on the TI-83)
6. a. arcsine, arccosine; arcsecant, arccosecant  
b. arccosecant, arccotangent (as graphed on the TI-83)  
c. arctangent  
d. none
7. In  $\sin(\sin^{-1}x)$  x has to be between -1 and 1 inclusive, whereas in  $\sin^{-1}(\sin x)$  x can be all real numbers.
8. Yes. The domain of  $\tan^{-1} x$  is all real numbers.
9.  $y = \sec x$  is entered as  $y = 1/(\cos x)$ .  
 $y = \sec^{-1} x$  is entered as  $y = \cos(1/x)$ .
10. a.  $(2\sqrt{2}, 45^\circ)$  b. (5,0) c.  $10, \pi/2)$  d.  $(\sqrt{3}, 1)$  e. (0,5) f. (-2.12, 2.12)
12.  $n_1 \sin \theta_1 = n_2 \sin \theta_2$ . It is used to find the angle of refraction of light of a single wavelength when it enters a light transmitting medium, such as water or glass.