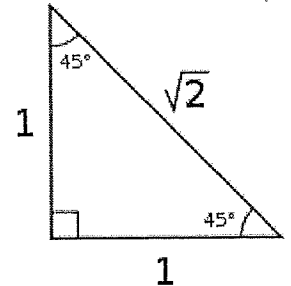
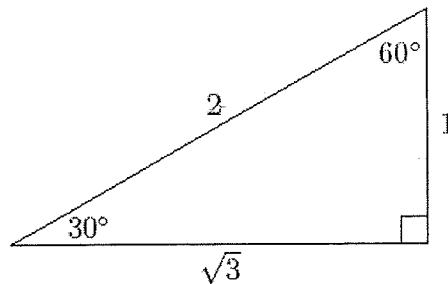
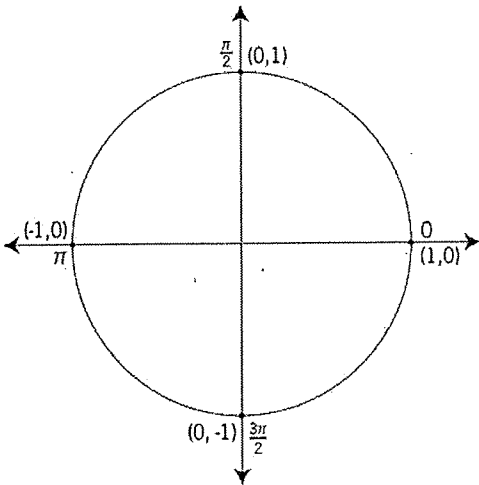


# 7.2 Graphs of CSC and SEC

Name: \_\_\_\_\_

Date: \_\_\_\_\_ Hour: \_\_\_\_\_

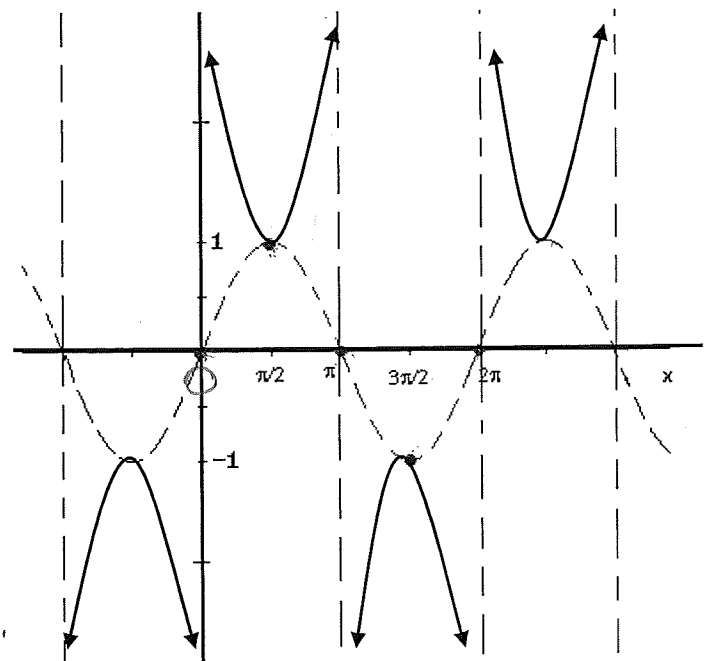
The graphs of cosecant and secant are the reciprocal functions of sine and cosine. In order to graph these functions we will use the original t-tables from the sine and cosine functions to create tables for cosecant and secant.



## Example 1

| $t$                          | $f(t) = \sin t$                  | $f(t) = \csc t$               |
|------------------------------|----------------------------------|-------------------------------|
| 0                            | $\frac{0}{1} = 0$                | $\frac{1}{0} = \text{undef.}$ |
| $30^\circ = \frac{\pi}{6}$   | $\frac{1}{2} = .5$               | $\frac{2}{1} = 2$             |
| $45^\circ = \frac{\pi}{4}$   | $\frac{\sqrt{2}}{2} \approx .71$ | 1.4                           |
| $60^\circ = \frac{\pi}{3}$   | $\frac{\sqrt{3}}{2} \approx .86$ | 1.15                          |
| $90^\circ = \frac{\pi}{2}$   | $\frac{1}{1} = 1$                | 1                             |
| $180^\circ = \pi$            | $\frac{0}{1} = 0$                | $\frac{1}{0} = \text{undef.}$ |
| $270^\circ = \frac{3\pi}{2}$ | $\frac{-1}{1} = -1$              | $\frac{1}{-1} = -1$           |
| $360^\circ = 2\pi$           | $\frac{0}{1} = 0$                | $\frac{1}{0} = \text{undef.}$ |

The asymptotes will occur where the value is undefined.



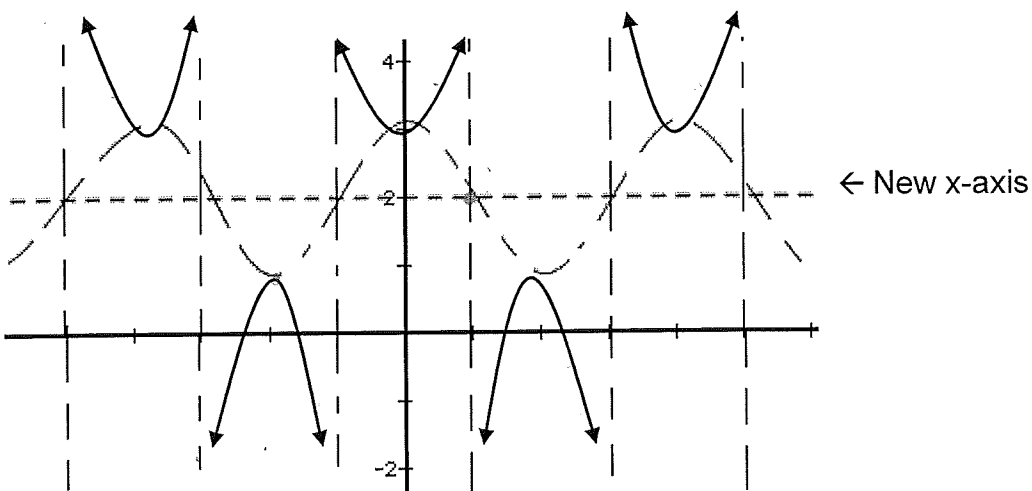
Graph the parent function  $y = \sin x$  (use a dotted line). The asymptotes will occur at the zeros. Then, Graph the reflection.

COS =

### Example 2

$$f(t) = \sec t + 2$$

$$f(t) = \cos t + 2$$



### Domain and Range

$$f(t) = \csc t \quad \frac{1}{\sin}$$

Domain:  $(-\infty, \infty)$  except multiples of  $\pi$  ( $k\pi$ , where  $k$  is an integer).

Range:  $[1, \infty), (-\infty, -1]$   $(-\infty, -1] \cup [1, \infty)$

Period:  $2\pi$

Because sine is odd, csc is also odd.

$$f(t) = \sec t$$

Domain:  $(-\infty, \infty)$  except odd multiples of  $\frac{\pi}{2}$  ( $k\frac{\pi}{2}$ , where  $k$  is an odd integer).

Range:  $[1, \infty), (-\infty, -1]$

Period:  $2\pi$

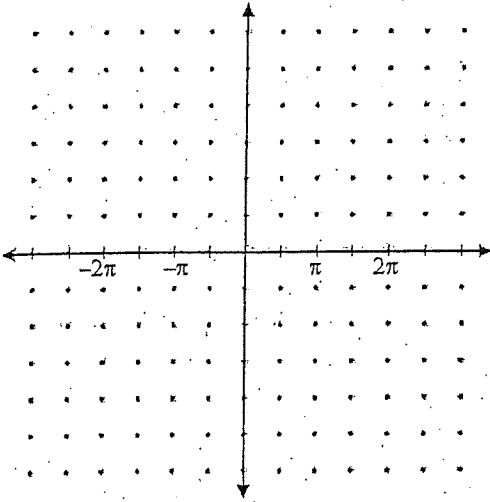
Because cosine is even, sec is also even.

PreCalculus  
 Worksheet 7.2 B  
 Graphing Secant and Cosecant

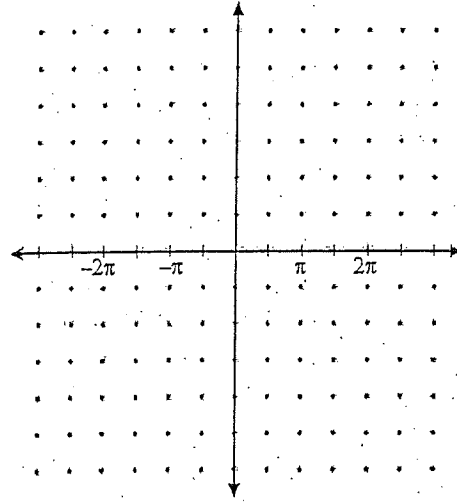
Name \_\_\_\_\_

Graph the following tangent and cotangent functions for  $-2\pi \leq t \leq 2\pi$ . Don't forget to graph all asymptotes.

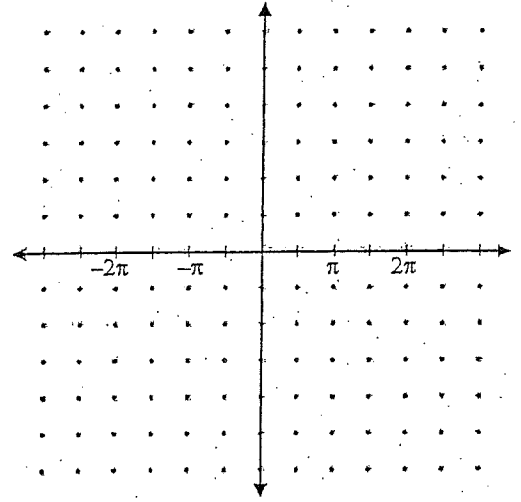
1.  $f(t) = \sec t - 2$



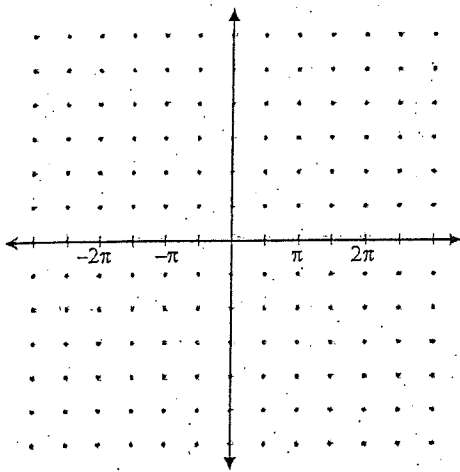
2.  $f(t) = 2 \csc t + 1$



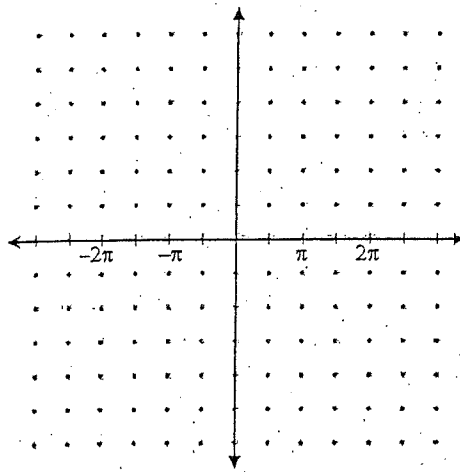
3.  $f(t) = 4 - 2 \sec t$



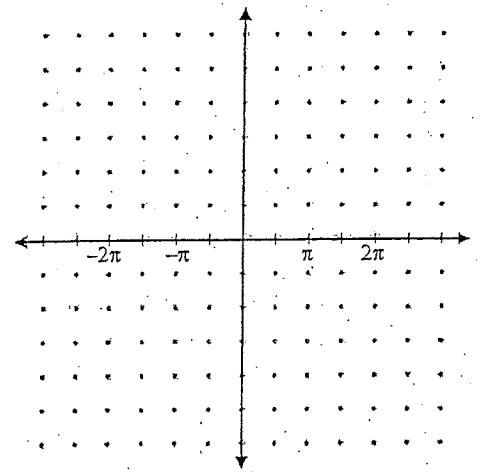
4.  $f(x) = -\csc x + 3$



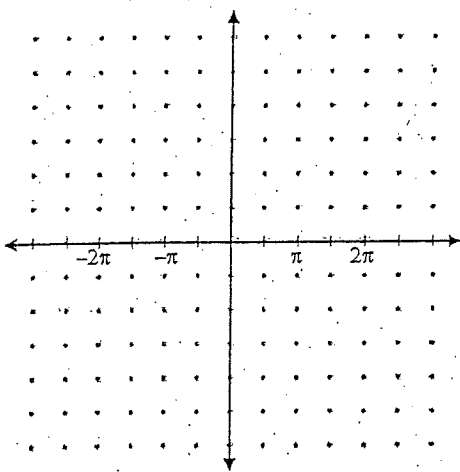
5.  $f(x) = 2|\csc x|$



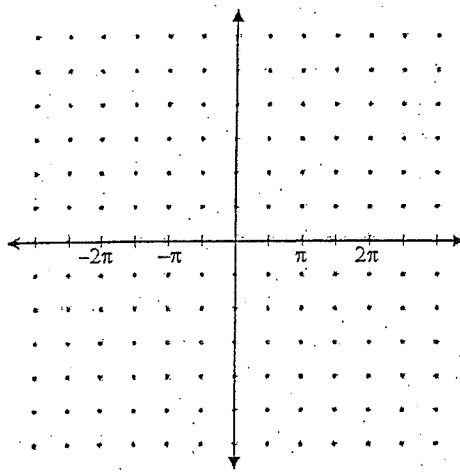
6.  $f(t) = -2|\sec t|$



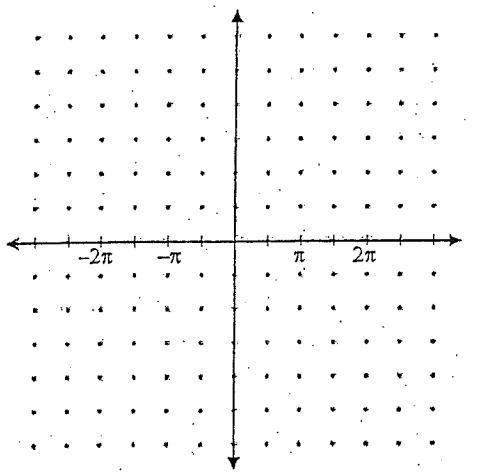
7.  $f(t) = |\sec t| + 2$



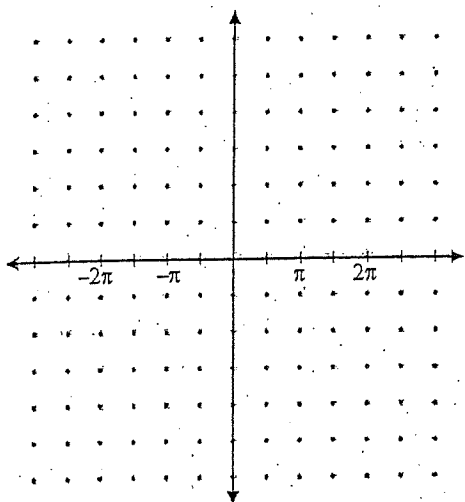
8.  $f(x) = 2 - |\csc x|$



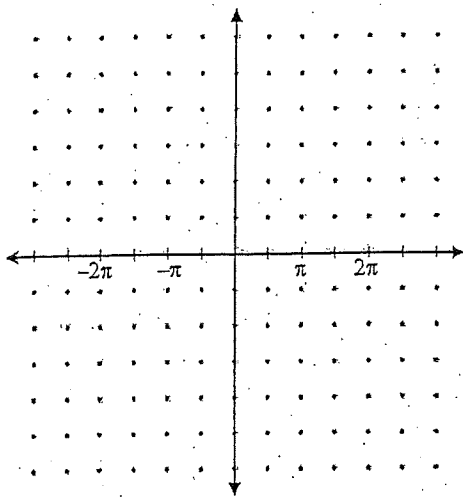
9.  $f(t) = 3 \csc t - 2$



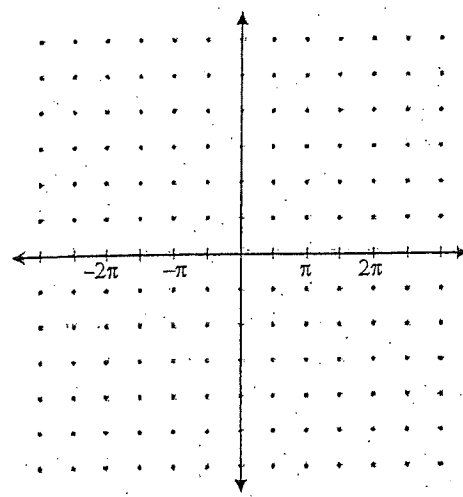
10.  $f(t) = -3\csc t + 1$



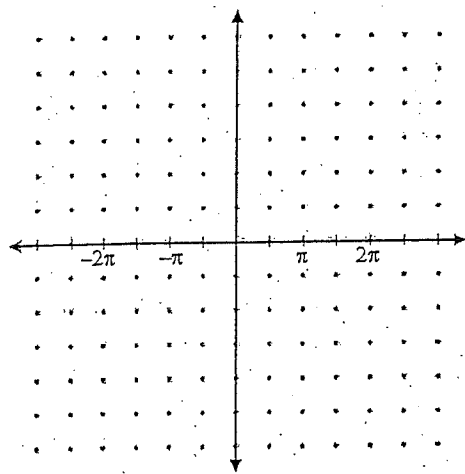
11.  $f(t) = -2\sec t + 2$



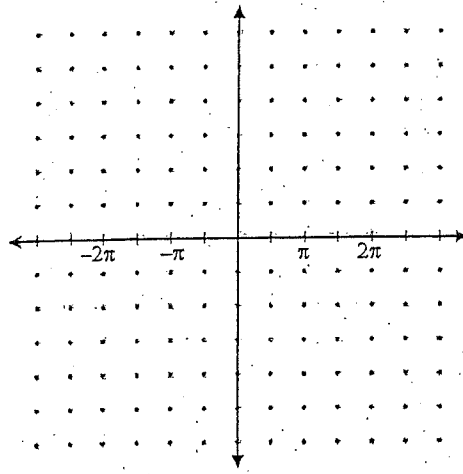
12.  $f(t) = \frac{1}{2}\csc t - 1$



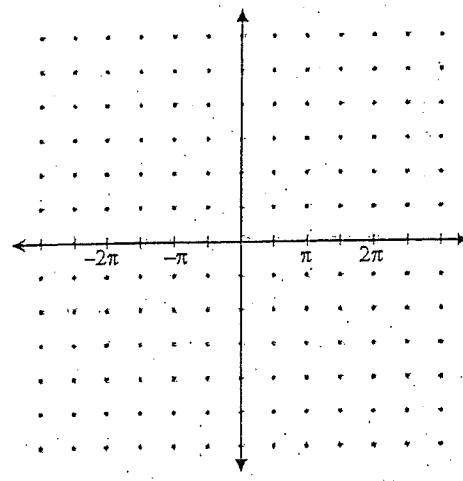
13.  $f(t) = 3\csc t + 2$



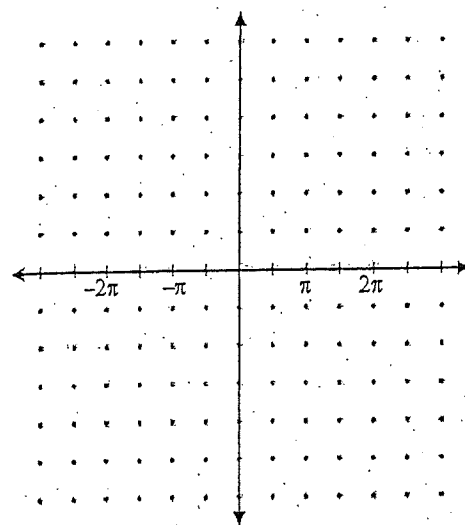
14.  $f(t) = -2\csc t - 1$



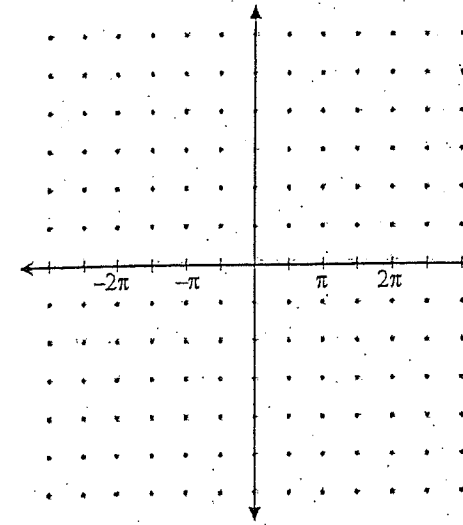
15.  $f(t) = -\frac{1}{2}\sec t - \frac{1}{2}$



16.  $f(t) = -2\sec t - 1$



17.  $f(t) = 2 + 2|\csc t|$



18.  $f(t) = -3\csc t - 2$

