NOTES—Graphs of Other Trig Functions

Graph each trigonometric function.

1) $y = \tan x$

x	y
0	$\frac{0}{1} = 0$
$\pi/2$	$\frac{1}{0}$ undefined
π	$\frac{0}{-1} = 0$
$3\pi/2$	$\frac{-1}{0}$ undefined
2π	0
$\pi/4$	1
$3\pi/4$	-1
$5\pi/4$	1

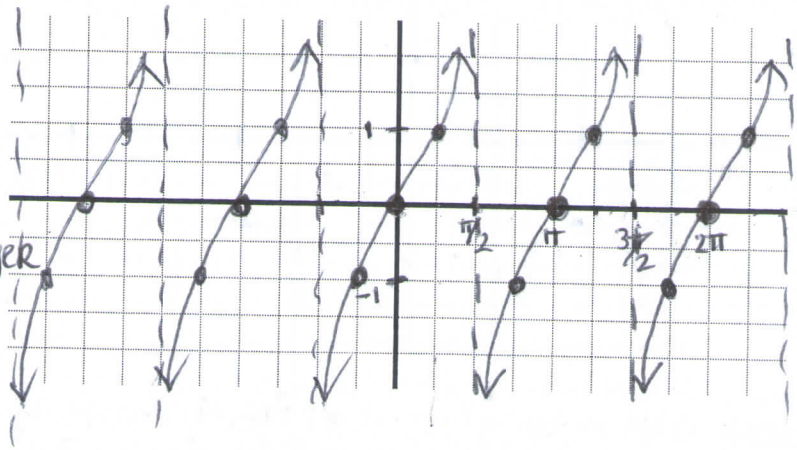
D: $(-\infty, \infty)$

$x \neq k \cdot \pi/2$

k is an odd integer

R: $(-\infty, \infty)$

per $= \pi$



2) $y = \cot x$

x	y
0	undef
$\pi/2$	0
π	undef
$3\pi/2$	0
2π	undef
$\pi/4$	1
$3\pi/4$	-1

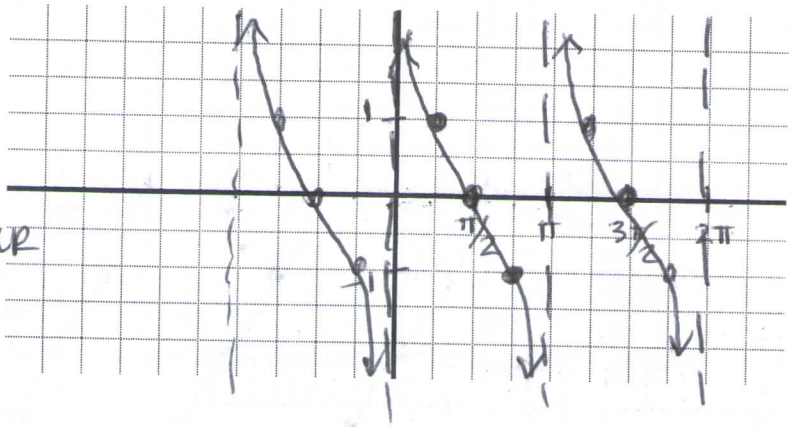
D: $(-\infty, \infty)$

$x \neq k\pi$

k is an integer

R: $(-\infty, \infty)$

per $= \pi$



3) $y = \sec x$

recip. of cosine

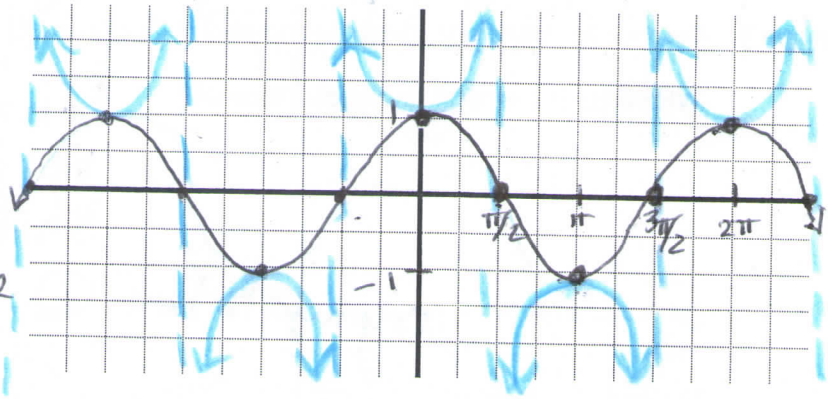
D: $(-\infty, \infty)$

$x \neq k \cdot \frac{\pi}{2}$

k is odd integer

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

per $= 2\pi$



4) $y = \csc x$

recip. of sine

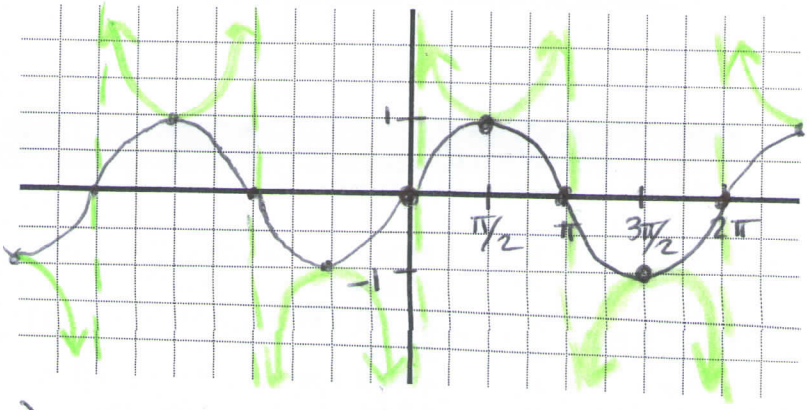
D: $(-\infty, \infty)$

$x \neq k\pi$

k is an integer

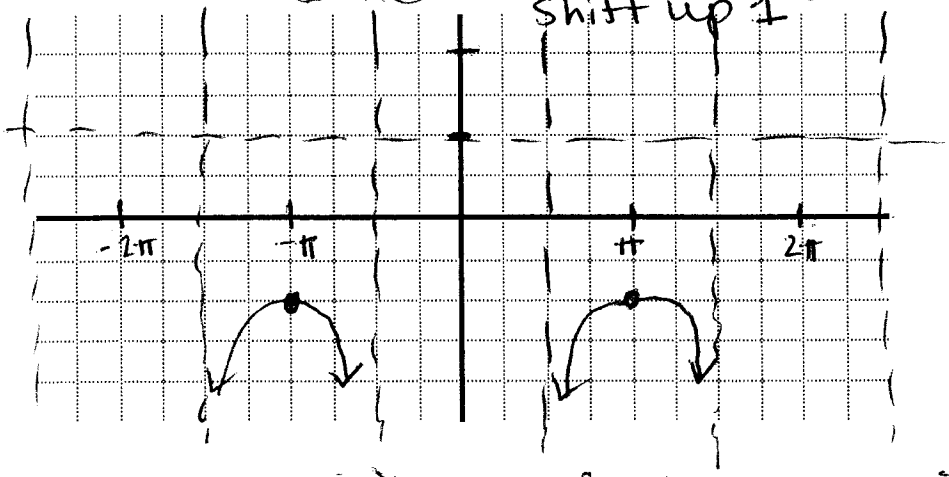
R: $(-\infty, -1] \cup [1, \infty)$

per $= 2\pi$



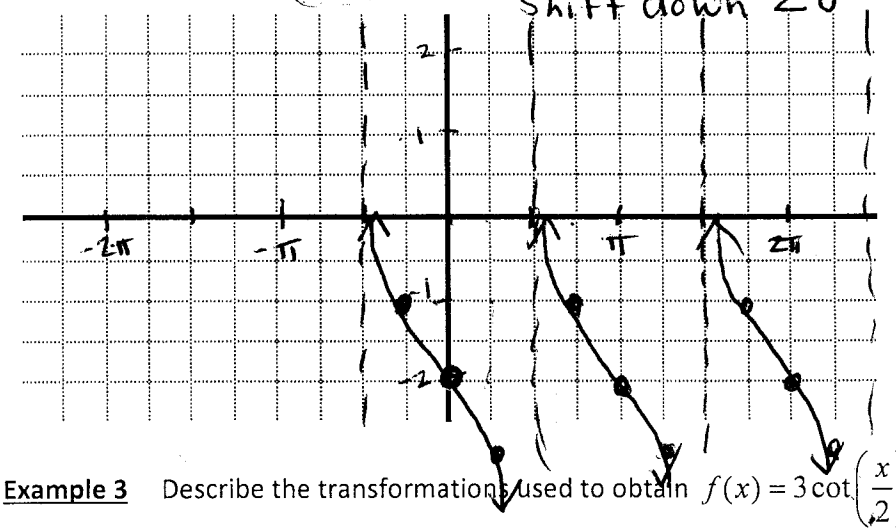
Example 1 Graph $y = 2\sec x + 1$

vert. stretch * 2
shift up 1



Example 2 Graph $y = \tan(-x) - 2$

reflect over y-axis
shift down 2



Example 3 Describe the transformations used to obtain $f(x) = 3\cot\left(\frac{x}{2}\right) + 1$ from its parent function.

Where are the vertical asymptotes located?

horiz. stretch * 2
vert. stretch * 3
Shift up 1

asymptotes @ $x = k \cdot \pi$

k is an even integer

Summary: Basic Trigonometric Functions

Function	Period	Domain	Range	Asymptotes	Zeros	Even/ Odd
$\sin x$	2π	All reals	$[-1, 1]$	None	$n\pi$	Odd
$\cos x$	2π	All reals	$[-1, 1]$	None	$\pi/2 + n\pi$	Even
$\tan x$	π	$x \neq \pi/2 + n\pi$	All reals	$x = \pi/2 + n\pi$	$n\pi$	Odd
$\cot x$	π	$x \neq n\pi$	All reals	$x = n\pi$	$\pi/2 + n\pi$	Odd
$\sec x$	2π	$x \neq \pi/2 + n\pi$	$(-\infty, -1] \cup [1, \infty)$	$x = \pi/2 + n\pi$	None	Even
$\csc x$	2π	$x \neq n\pi$	$(-\infty, -1] \cup [1, \infty)$	$x = n\pi$	None	Odd