

## Graphs of Trigonometric Functions

EQ: What is a periodic function and how does it appear?

## Vocabulary

Cycle - when a graph of a function repeats at regular intervals, one full set.

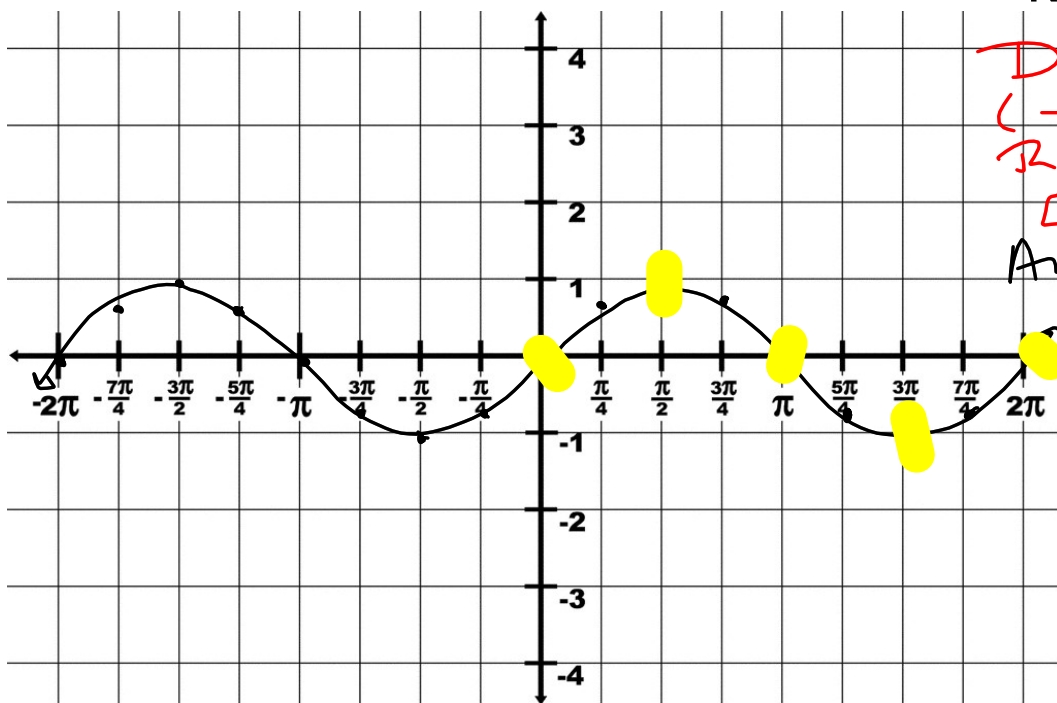
Period - the length of a cycle.

Amplitude - the height of a function from its middle point to its extrema.

	cos x	sin x	tan x	sec x	csc x	cot x
0						
$\frac{\pi}{6}$						
$\frac{\pi}{4}$						
$\frac{\pi}{3}$						
$\frac{\pi}{2}$						
$\frac{2\pi}{3}$						
$\frac{3\pi}{4}$						
$\frac{5\pi}{6}$						
$\pi$						
$\frac{7\pi}{6}$						
$\frac{5\pi}{4}$						
$\frac{4\pi}{3}$						
$\frac{3\pi}{2}$						
$\frac{5\pi}{3}$						
$\frac{7\pi}{4}$						
$\frac{11\pi}{6}$						
$2\pi$						

$$f(x) = \sin x$$

key features

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

Amp: 1

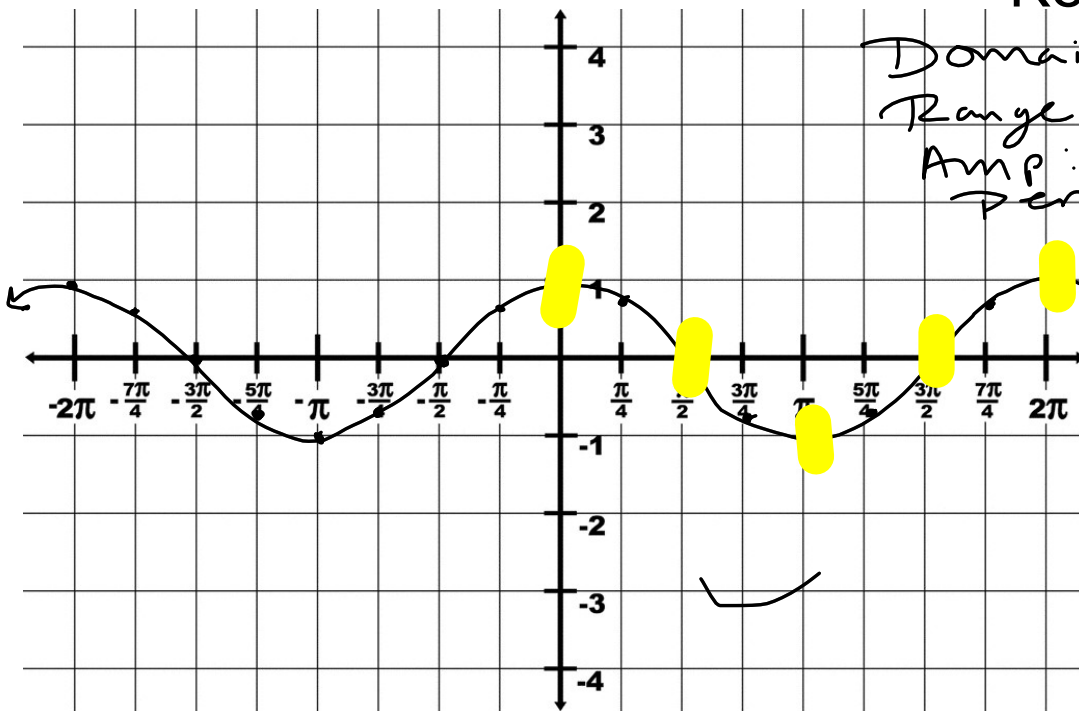
Period:

 $2\pi$ Midline  
 $y = 0$

$f(x) = \cos x$

Key features

Domain:  $(-\infty, \infty)$   
 Range:  $[-1, 1]$   
 Amp: 1  
 Period:  $2\pi$   
 midline  $y=0$



## Transformation task



What did we learn

Sometimes  $h$  and  $k$  are written  
as  $c$  and  $d$ .

$D$  or  $k \rightarrow$  Vertical translation  
 $C$  or  $h \rightarrow$  horizontal translation  
 \* opp. direction

$a \rightarrow$  Vertical Stretch  $|a| > 1$   
 or Shrink  $|a| < 1$

- a reflect over x-axis

$b \rightarrow$  Horizontal stretch  $|b| < 1$   
 or Shrink  $|b| > 1$

\* Shrink  $\rightarrow$  Compression

Key Features are affected

a → Range, Amplitude

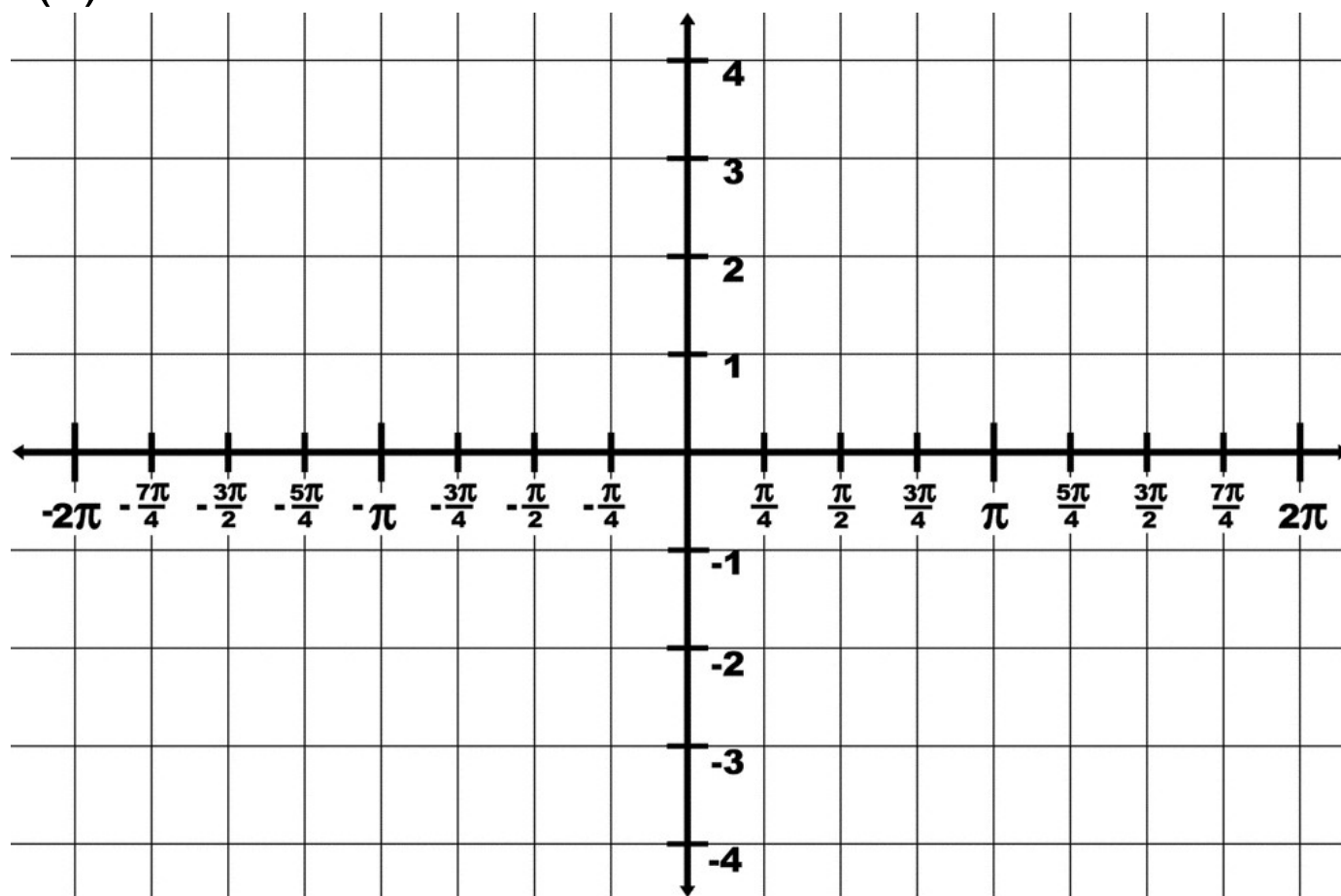
b → period, domain

c → x-intercepts

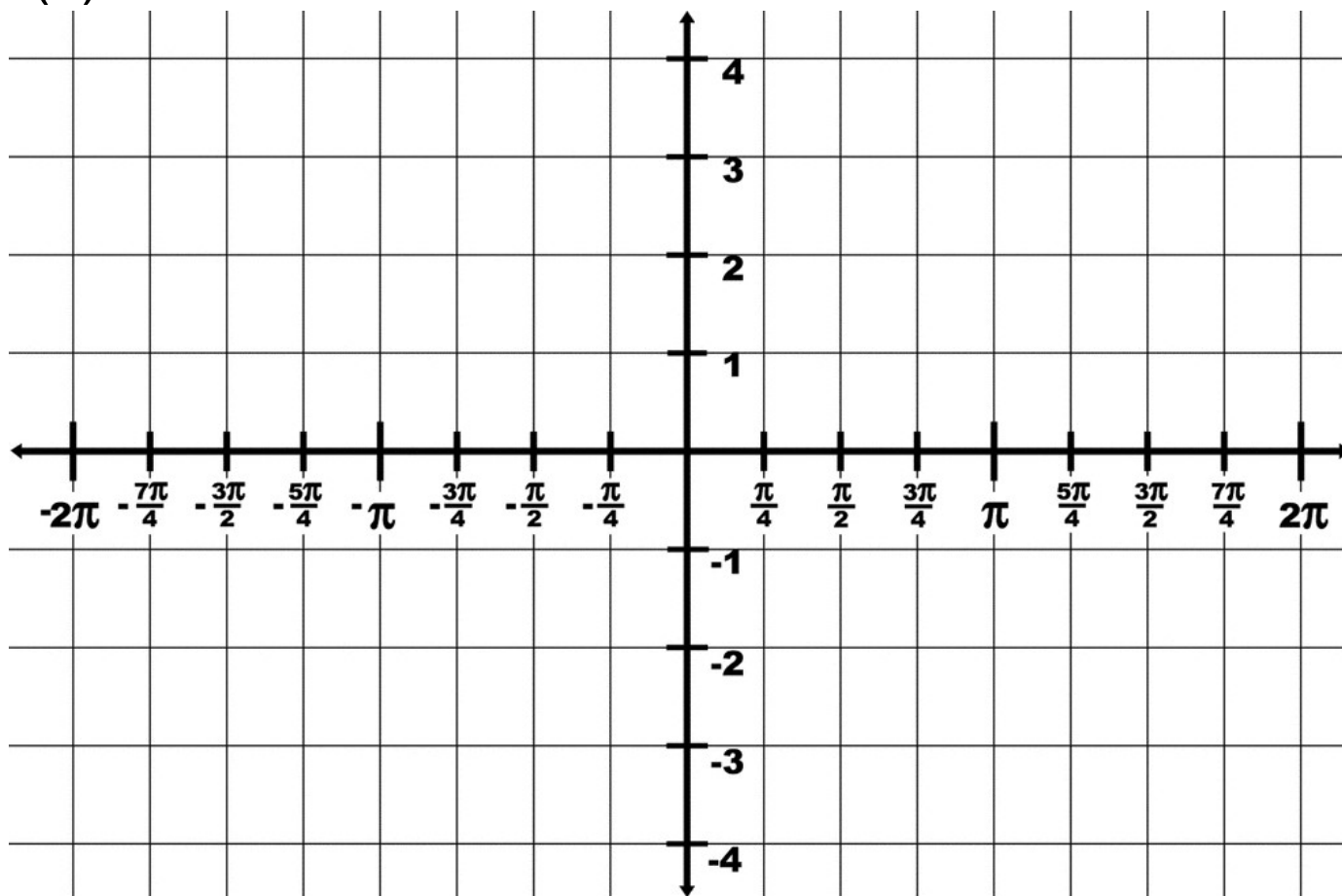
d → Range, midline



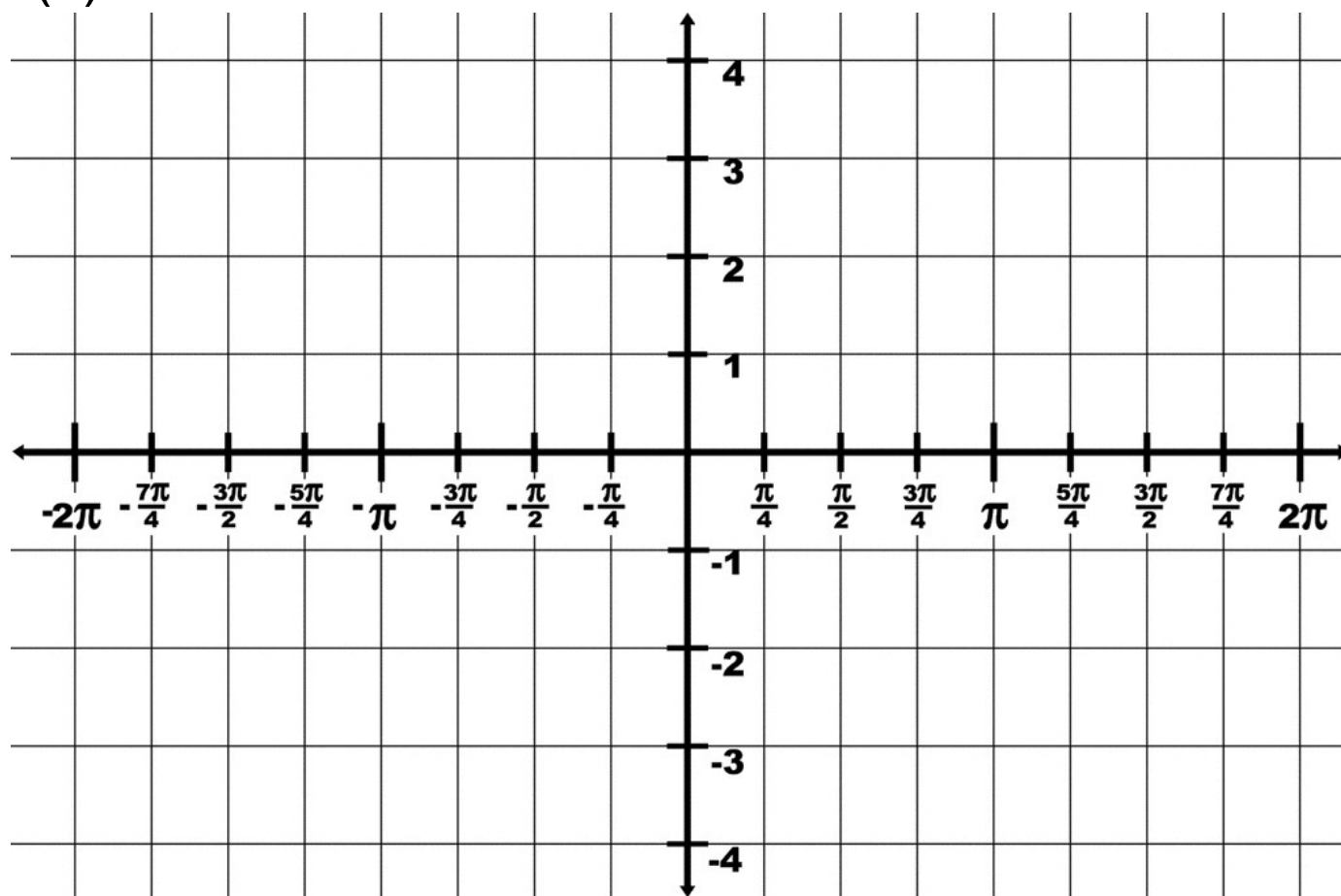
$$f(x) = \tan x$$



$$f(x) = \text{Csc } x$$



$$f(x) = \sec x$$



$$f(x) = \text{Cot } x$$

