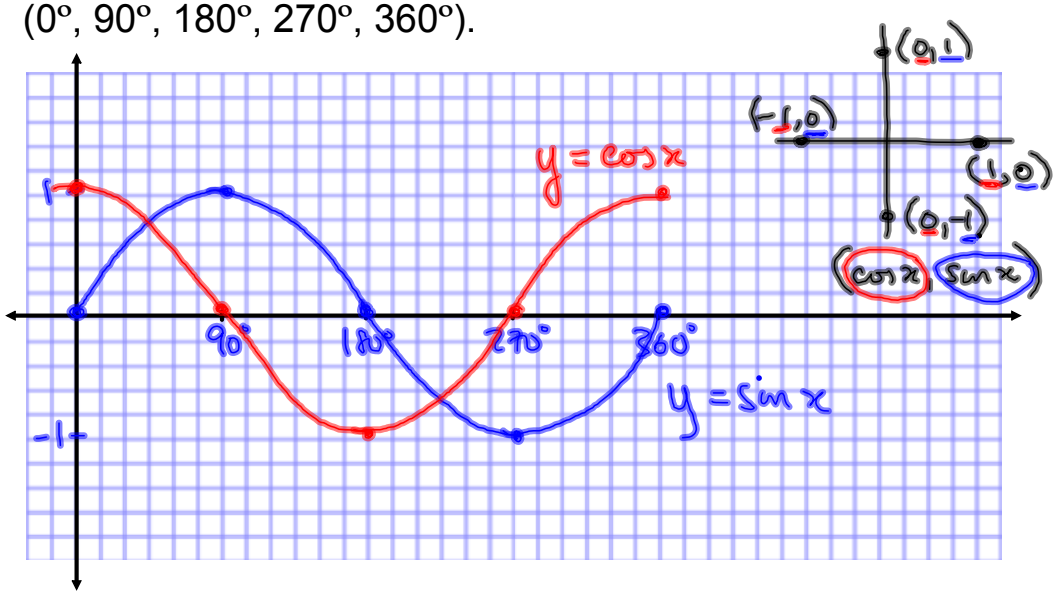
Graphing Transformations of Trig Functions

May 17/2011

The simplest way to sketch the parent function for sine or cosine is to use 5 key points at 90º intervals (0º, 90º, 180º, 270º, 360º).



May 17-9:19 AM

To graph a transformed function, you can:

(a) transform each point using $y = af[k(x-p)]+q$

- a - vertical reflection and scaling
- k - horizontal reflection and scaling
- p - horizontal translation or shift
- q - vertical translation or shift

$$(x,y)\rightarrow(x,ay)\rightarrow\left(\frac{x}{k},ay\right)\rightarrow\left(\frac{x}{k}+p,ay\right)\rightarrow\left(\frac{x}{k}+p,ay+q\right)$$

May 17-9:23 AM

(b) Graphing using properties

a - vertical reflection and amplitude
k - horizontal reflection and period

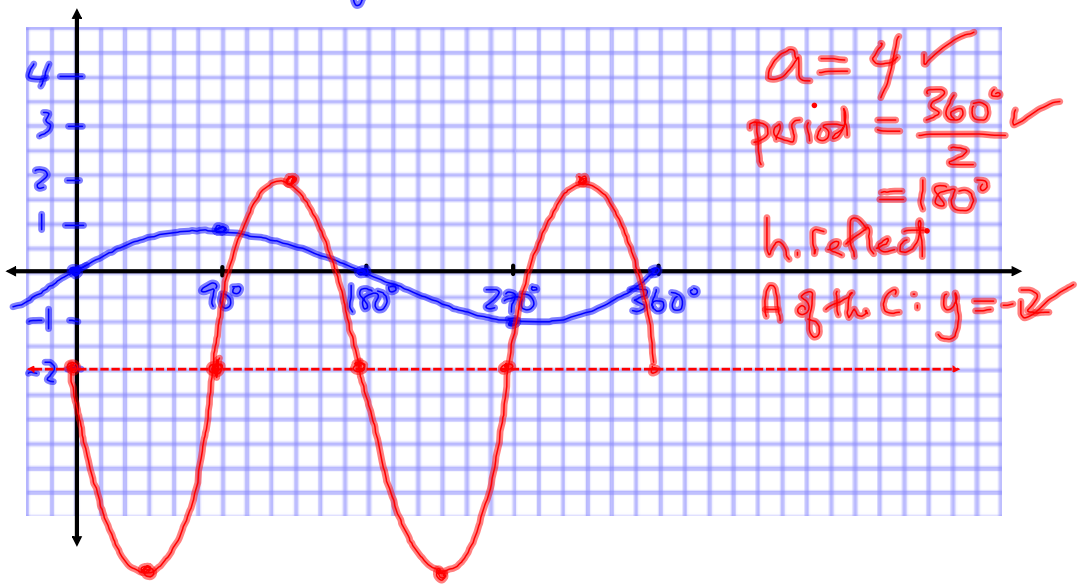
$$period = \frac{360°}{k}$$

p - phase shift of starting point
q - axis of the curve, $y = q$

May 17-9:18 AM

WS Ex.3

$y = 4\sin(-2x) - 2$



$a = 4$ ✓
period $= \frac{360°}{2}$ ✓
$= 180°$
h. reflect
A & th C: $y = -2$ ✓

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p.377 #18

$y = a\sin[k(x-p)] + q \to 0$

$23 = \frac{360}{k}$

$k = \frac{360}{23}$

$k \doteq 15.7$

$a = 1$

$\text{period} = \frac{360}{k}$

$\begin{pmatrix} 23 \\ 28 \\ 33 \end{pmatrix} \to 3$ k values

p → start point → date of birth

$p = 0$

28: $k \doteq 12.9$

33: $k \doteq 10.9$

23: $y = \sin(15.7x)$

28: $y = \sin(12.9x)$

33: $y = \sin(10.9x)$

p.387 #1-6 (skipping questions using 'radians' for angles ('pi' notation))

May 17-10:57 AM