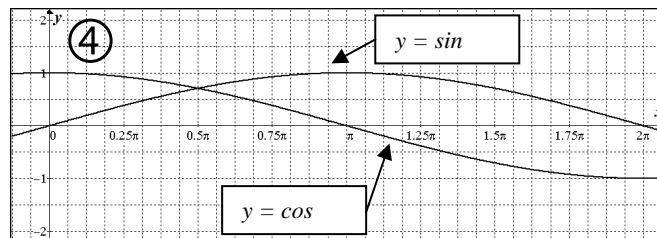
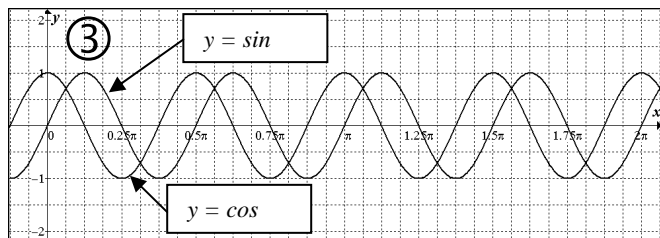
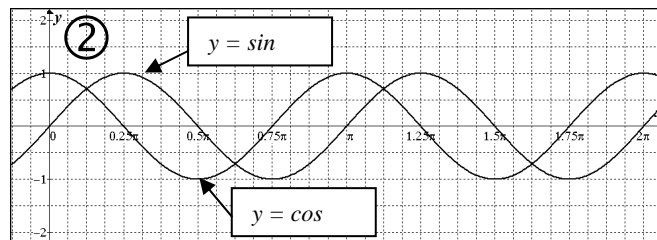
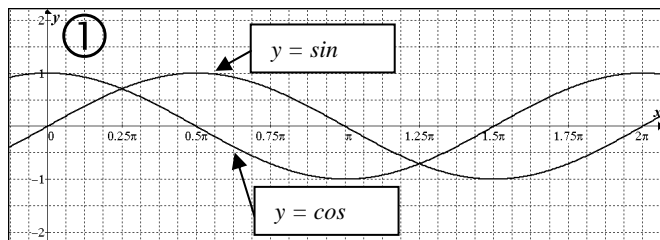


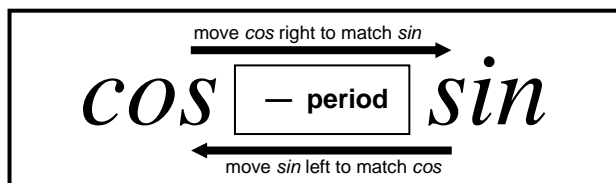
Converting Between Sine & Cosine

Date:



In...

- ① Period of both *sin* and *cos* = _____. To put *cos* on top of *sin*, shift *cos* _____ to the _____.
- ② Period of both *sin* and *cos* = _____. To put *cos* on top of *sin*, shift *cos* _____ to the _____.
- ③ Period of both *sin* and *cos* = _____. To put *cos* on top of *sin*, shift *cos* _____ to the _____.
- ④ Period of both *sin* and *cos* = _____. To put *cos* on top of *sin*, shift *cos* _____ to the _____.



#	Amplitude	Period	Phase Shift	Vertical Shift	Equation with <i>sin</i>	Same curve using <i>cos</i>
1.	1	2π	$\pi/4$ left	0		
2.	2	4π	$3\pi/2$ left	2 up		
3.	7	π	$\pi/4$ left	1 down		
4.	$1/2$	$\pi/4$	$\pi/8$ right	$3/5$ up		
5.	3	8π	$5\pi/6$ left	$1/8$ down		

#	Amplitude	Period	Phase Shift	Vertical Shift	Equation with <i>cos</i>	Same curve using <i>sin</i>
6.	4	3π	$4\pi/3$ right	5 up		
7.	2	$2\pi/5$	$\pi/5$ left	3 up		
8.	5	$5\pi/2$	$5\pi/6$ left	4 down		
9.	$3/2$	$3\pi/4$	$\pi/12$ right	1 down		
10.	$5/4$	$7\pi/5$	$5\pi/6$ left	0		

Converting Between Sine & Cosine

Date: _____

Convert sin to cos or cos to sin in each of the following:

11. $y = \sin \frac{1}{8}x$ _____ 12. $y = 2 \cos \frac{3}{4}x$ _____

13. $y = \sin \frac{2}{5}x$ _____ 14. $y = \cos 10x$ _____

15. $y = \sin 4\left(x - \frac{\pi}{8}\right)$ _____ 16. $y = 3 \cos 3\left(x + \frac{\pi}{4}\right)$ _____

17. $y = 2 \sin \frac{1}{3}\left(x - \frac{7\pi}{3}\right)$ _____ 18. $y = \sin \frac{4}{3}x + 3$ _____

19. $y = \cos \frac{7}{11}x$ _____ 20. $y = \cos 9x$ _____

Answers:

1.	$y = \sin\left(x + \frac{\pi}{4}\right)$	$y = \cos\left(x - \frac{\pi}{4}\right)$
2.	$y = 2 \sin \frac{1}{2}\left(x + \frac{3\pi}{2}\right) + 2$	$y = 2 \cos \frac{1}{2}\left(x + \frac{\pi}{2}\right) + 2$
3.	$y = 7 \sin 2\left(x + \frac{\pi}{4}\right) - 1$	$y = 7 \cos 2x - 1$
4.	$y = \frac{1}{2} \sin 8\left(x - \frac{\pi}{8}\right) + \frac{3}{5}$	$y = \frac{1}{2} \cos 8\left(x - \frac{3\pi}{16}\right) + \frac{3}{5}$
5.	$y = 3 \sin \frac{1}{4}\left(x + \frac{5\pi}{6}\right) - \frac{1}{8}$	$y = 3 \cos \frac{1}{4}\left(x - \frac{7\pi}{6}\right) - \frac{1}{8}$
6.	$y = 4 \cos \frac{2}{3}\left(x - \frac{4\pi}{3}\right) + 5$	$y = 4 \sin \frac{2}{3}\left(x - \frac{7\pi}{12}\right) + 5$
7.	$y = 2 \cos 5\left(x + \frac{\pi}{5}\right) + 3$	$y = 2 \sin 5\left(x + \frac{3\pi}{10}\right) + 3$
8.	$y = 5 \cos \frac{4}{5}\left(x + \frac{5\pi}{6}\right) - 4$	$y = 5 \sin \frac{4}{5}\left(x + \frac{35\pi}{24}\right) - 4$
9.	$y = \frac{3}{2} \cos \frac{8}{3}\left(x - \frac{\pi}{12}\right) - 1$	$y = \frac{3}{2} \sin \frac{8}{3}\left(x + \frac{5\pi}{48}\right) - 1$
10.	$y = \frac{5}{4} \cos \frac{10}{7}\left(x + \frac{5\pi}{6}\right)$	$y = \frac{5}{4} \sin \frac{10}{7}\left(x + \frac{71\pi}{60}\right)$

11.	$y = \cos \frac{1}{8}(x - 4\pi)$	12.	$y = 2 \sin \frac{3}{4}\left(x + \frac{2\pi}{3}\right)$
13.	$y = \cos \frac{2}{5}\left(x - \frac{5\pi}{4}\right)$	14.	$y = \sin 10\left(x + \frac{\pi}{20}\right)$
15.	$y = \cos 4\left(x - \frac{\pi}{4}\right)$	16.	$y = 3 \sin 3\left(x + \frac{5\pi}{12}\right)$
17.	$y = 2 \cos \frac{1}{3}\left(x - \frac{23\pi}{6}\right)$	18.	$y = \cos \frac{4}{3}\left(x - \frac{3\pi}{8}\right) + 3$
19.	$y = \sin \frac{7}{11}\left(x + \frac{11\pi}{14}\right)$	20.	$y = \sin 9\left(x + \frac{\pi}{18}\right)$