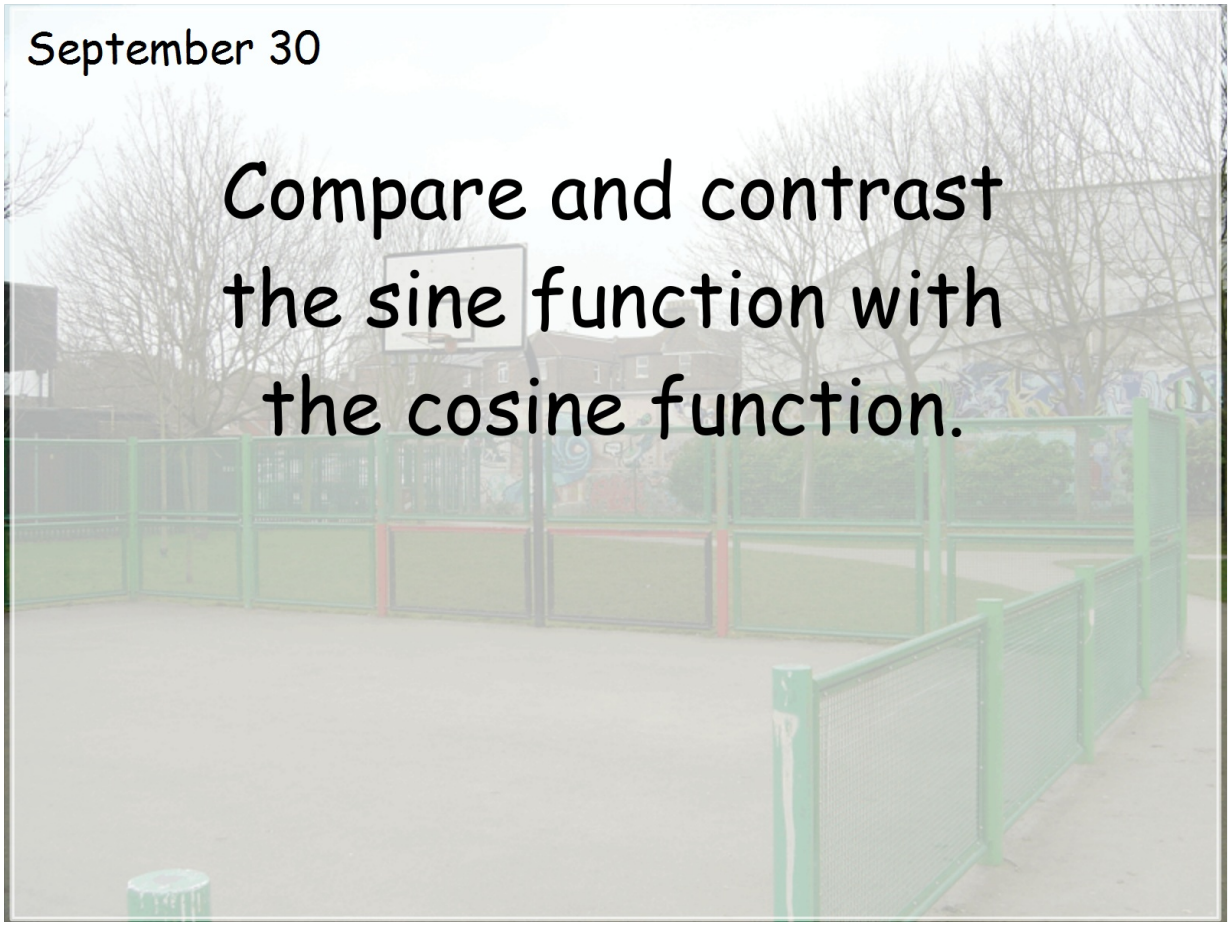


September 30

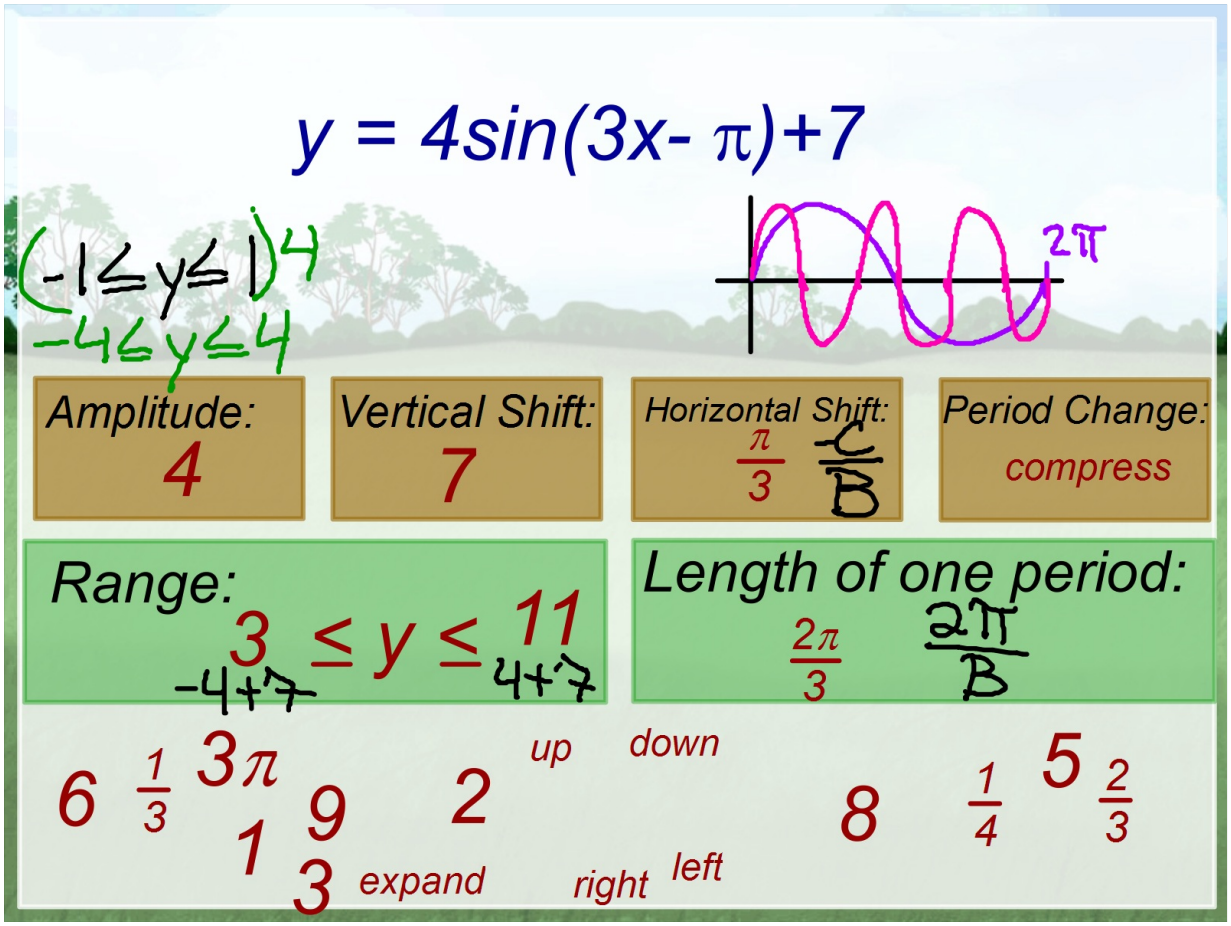
Students will verbally explain how to graph sine and cosine functions

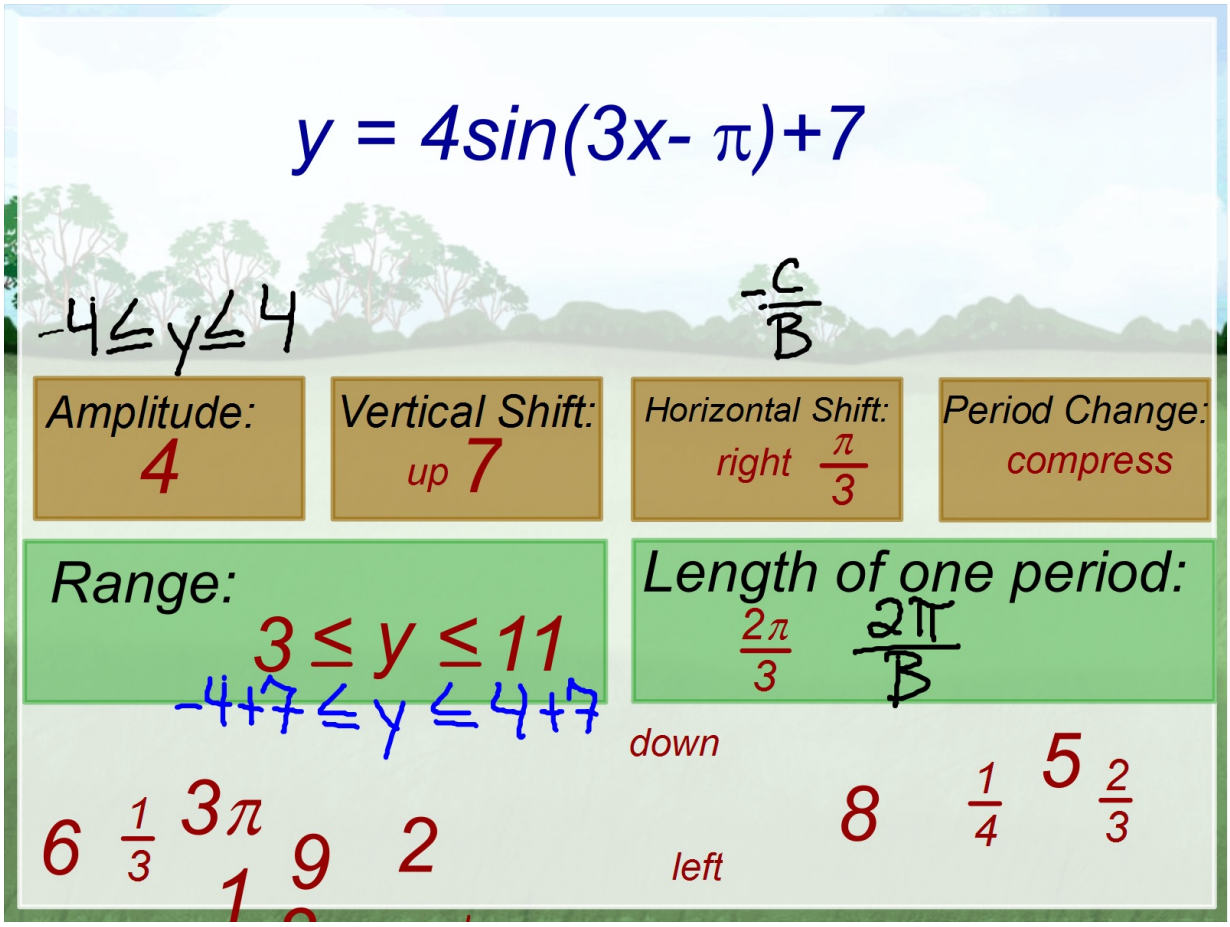
(using the words:
range, right triangles, periodic…)

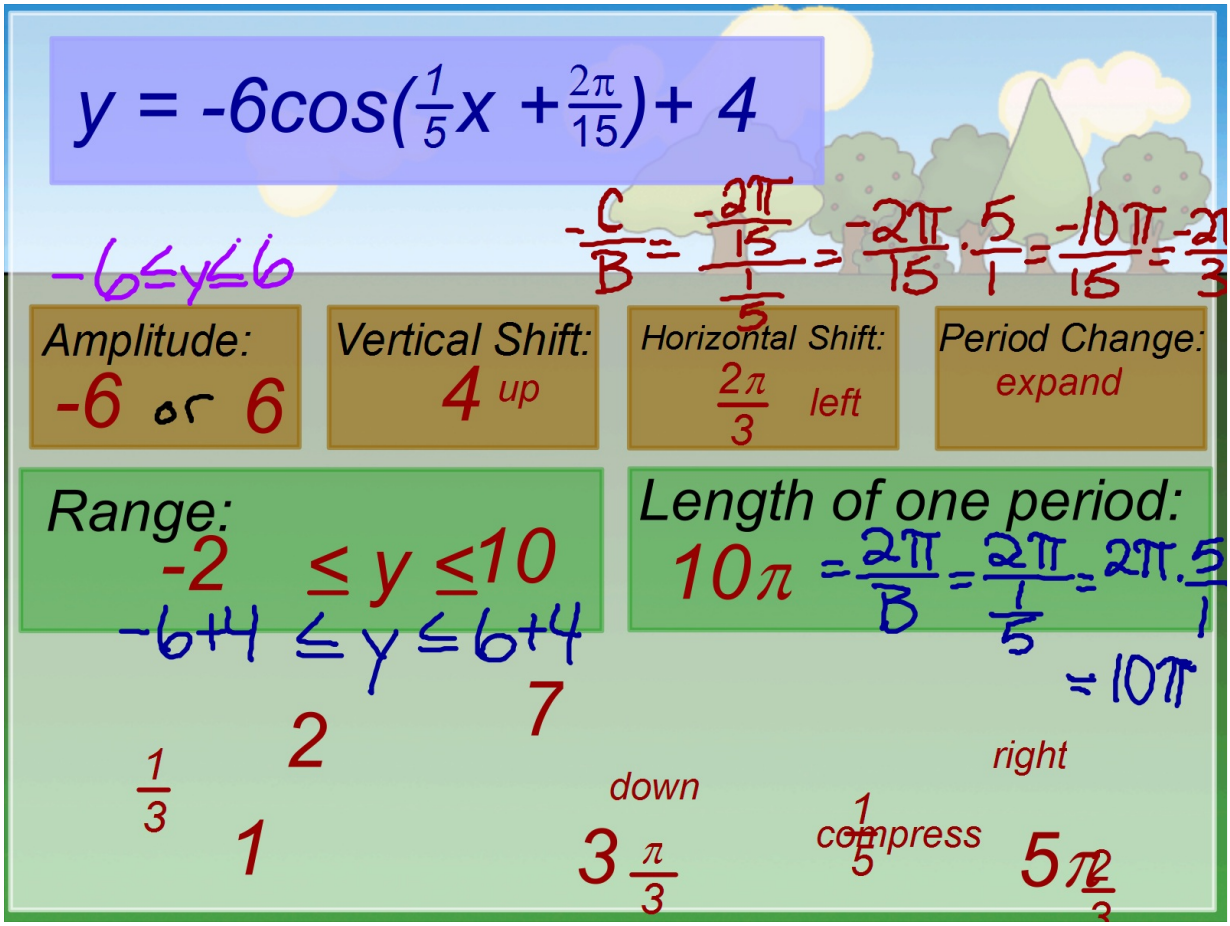
☺ Converting between degrees and radians
(worksheet)

☺ Unit Circle questions
(pg 133)

☺ Graphs of Sine and Cosine - all transformations
(worksheet and pg 166)




y = 4sin(3x- π)+7
-4≤y≤4
-C/B
Amplitude:
4
Vertical Shift:
up 7
Horizontal Shift:
right π/3
Period Change:
compress
Range:
3 ≤ y ≤ 11
-4+7≤y≤4+7
Length of one period:
2π/3
2π/B
down
left
6 1/3 3π 9 2
8 1/4 5 2/3


y = -6cos(1/5x + 2π/15)+ 4
-6≤y≤6
-C/B = -2π/15 / 1/5 = -2π/15 · 5/1 = -10π/15 = -2/3
Amplitude:
-6 or 6
Vertical Shift:
4 up
Horizontal Shift:
2π/3 left
Period Change:
expand
Range:
-2 ≤ y ≤10
-6+4 ≤ y ≤ 6+4
Length of one period:
10π = 2π/B = 2π/1/5 = 2π · 5/1
= 10π
right
down
compress
1/5
1/3
2
7
1
3π/3
5π/3

Basic Trigonometric Transformations
Student Activity

Name _____
Class _____

Move to page 4.4.

6. The function shown on this page has the equation **f1**$(x) = -1.5\sin\left(x + \frac{\pi}{4}\right) + 4$. Write an equation for a cosine function that will have the same graph.

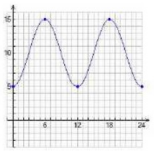
Move to page 4.5.

7. The function shown on this page has the equation **f2**$(x) = 3\sin(2x) - 5$. Write an equation for a cosine function that will have the same graph.

8. a. Write an equation for a sine function with an amplitude of 4, a period of 12, a horizontal shift of 2, and a vertical shift of 3.

   b. Write an equation for a cosine function with the same parameters as the sine function in part (a).

9. a. Write an equation for the sine function whose graph is shown in the figure below.



   b. Utilize a cosine function to write an equation for the same graph.

6. The function shown on this page has the equation **f1**$(x) = -1.5\sin\left(x + \frac{\pi}{4}\right) + 4$. Write an equation for a cosine function that will have the same graph.

$-1.5\cos(-1x + \frac{\pi}{4}) + 4$

$-1.5\cos(x - \frac{\pi}{4}) + 4$

$1.5\cos(x + \frac{3\pi}{4}) + 4$

$\frac{\pi}{4} + \frac{2\pi}{4} = \frac{3\pi}{4}$

$+\frac{\pi}{2}$

$\frac{\pi}{4} - \frac{\pi}{2} = -\frac{\pi}{4}$

7. The function shown on this page has the equation **f2**$(x) = 3\sin(2x) - 5$. Write an equation for a cosine function that will have the same graph.

$y = -3\cos(2x + \frac{\pi}{2}) - 5$

$y = 3\cos(-2x + \frac{\pi}{2}) - 5$

-change sign on amplitude and add $\frac{\pi}{2}$ to c

6. The function shown on this page has the equation **f1**$(x) = -1.5\sin\left(x + \frac{\pi}{4}\right) + 4$. Write an equation for a cosine function that will have the same graph.

$1.5\cos\left(x+\frac{\pi}{4}\right)+4$ $-1.5\cos\left(x-\frac{\pi}{4}\right)+4$

$1.5\cos\left(x+\frac{3\pi}{4}\right)+4$

$\frac{\pi}{4}+\frac{\pi}{2}=\frac{\pi}{4}+\frac{2\pi}{4}=\frac{3\pi}{4}$

$\frac{\pi}{4}-\frac{\pi}{2}=\frac{\pi}{4}-\frac{2\pi}{4}=\frac{-\pi}{4}$

7. The function shown on this page has the equation **f2**$(x) = 3\sin(2x) - 5$. Write an equation for a cosine function that will have the same graph.

$3\cos(2x-1.5)-5$

$3\cos\left(2x-\frac{\pi}{2}\right)-5$

8. a. Write an equation for a sine function with an amplitude of 4, a period of 12, a horizontal shift of 2, and a vertical shift of 3.

$y = 4\sin\left(\frac{\pi}{6}x-\frac{\pi}{3}\right)+3$

b. Write an equation for a cosine function with the same parameters as the sine function in part (a).

$A=4$

$D=3$

$B=\frac{\pi}{6}$

$C=-\frac{\pi}{3}$

$\frac{2\pi}{B}=12$

$B\left(\frac{2\pi}{B}\right)=(12)B$

$2\pi=12B$

$\frac{2\pi}{12}=\frac{12B}{12}$

$\frac{\pi}{6}=B$

$-\frac{C}{B}=2$

$B\left(-\frac{C}{B}\right)=(2)B$

$-C=2B$

$-C=2\left(\frac{\pi}{6}\right)$

$-C=\frac{2\pi}{6}=\frac{\pi}{3}$

pg 166 #3 - 12 (multiples of 3), 17, 19, 21,
43, 45, 48, 49, 51, 54, 55, 57, 58