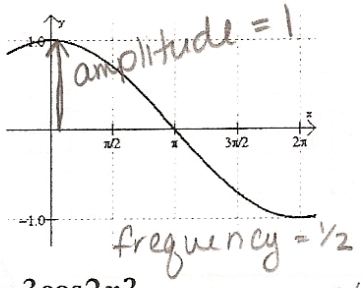
Name Key Date _____ Period _____

Test 11 Review Ms. Cronin

Trigonometry Graphs Review

Part I: Multiple Choice. Write the number of the best choice on the line provided.

4 **1.** What is the equation for the accompanying graph?



(1) $y = \cos 2x$ (3) $y = 2\cos x$

(2) $y = \frac{1}{2}\cos x$ (4) $y = \cos\frac{1}{2}x$

1 **2.** What is the period of the graph whose equation is $y = 3\cos 2x$?

(1) 180° (2) 2 (3) 3 (4) 360° $P = \frac{360}{|b|} = \frac{360}{2} = 180$

4 **3.** What is the range of the function $y = 5\sin x$?

$R: -a \le y \le a$

(1) $0° \le x \le 360°$ (3) $-1 \le y \le 1$

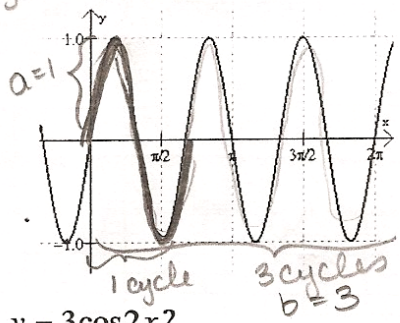
(2) $0° \le y \le 360°$ (4) $-5 \le y \le 5$

3 **4.** Which function has the same period as $y = 4\cos 2x$? $P = \frac{360}{|b|} = \frac{360}{2} = 180$

(1) $y = 4\cos x$ (2) $y = 4\sin x$ (3) $y = \tan x$ (4) $y = \tan 2x$

tan always has a period of 180°

3 **5.** What is the equation for the accompanying graph?



(1) $y = 3\sin 3x$

(2) $y = 3\sin x$

(3) $y = \sin 3x$

(4) $y = \sin\frac{1}{3}x$

3 **6.** What is the amplitude of the graph of the equation $y = 3\cos 2x$?

(1) 1 (2) 2 (3) 3 (4) 180

1 **7.** What is the minimum value in the range of $y = 2\sin x + 3$?

(1) 1 (2) 0 (3) -1 (4) -5

2 **8.** For which value of θ is $\tan\theta$ undefined?

(1) 0 (2) $\frac{\pi}{2} = 90°$ (3) $\pi = 180°$ (4) It is never undefined.

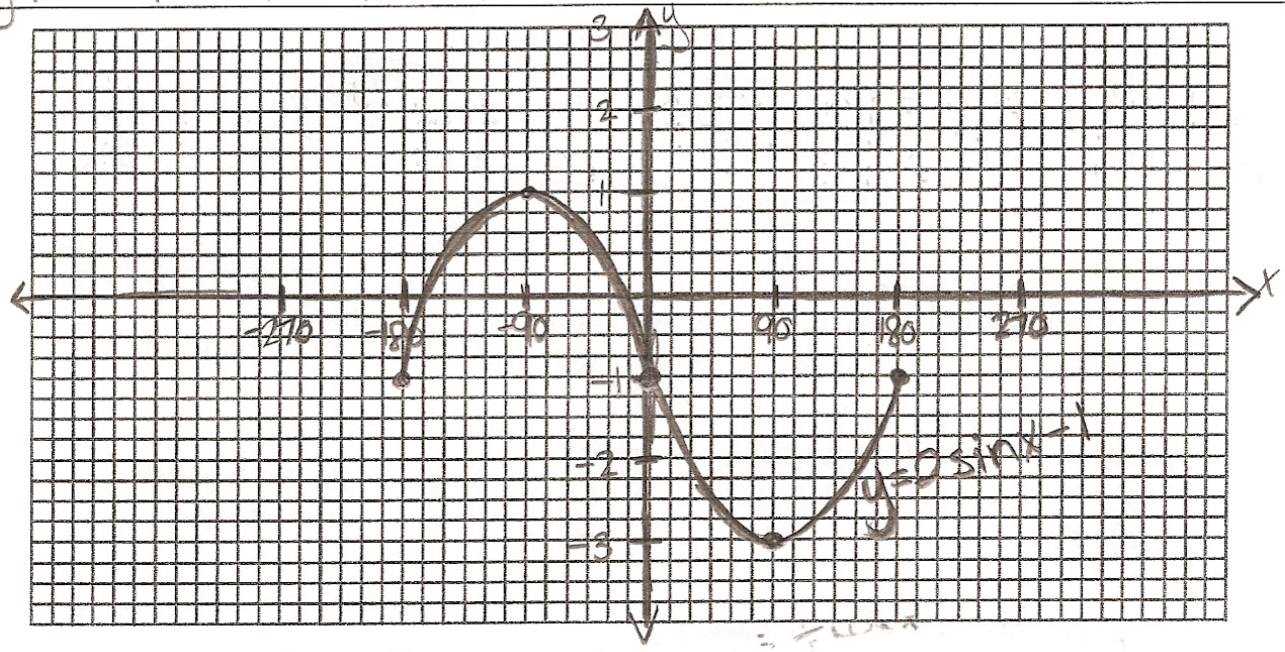
Part II: Graphing. For each question in this section, make a table of values and graph the equations. Answer any questions that follow.

b=1 → count by 90's

9. Graph the equation $y = 2\sin x - 1$ in the interval $-180° \le x \le 180°$.

→ in calculator: Y= 2sin(X) − 1

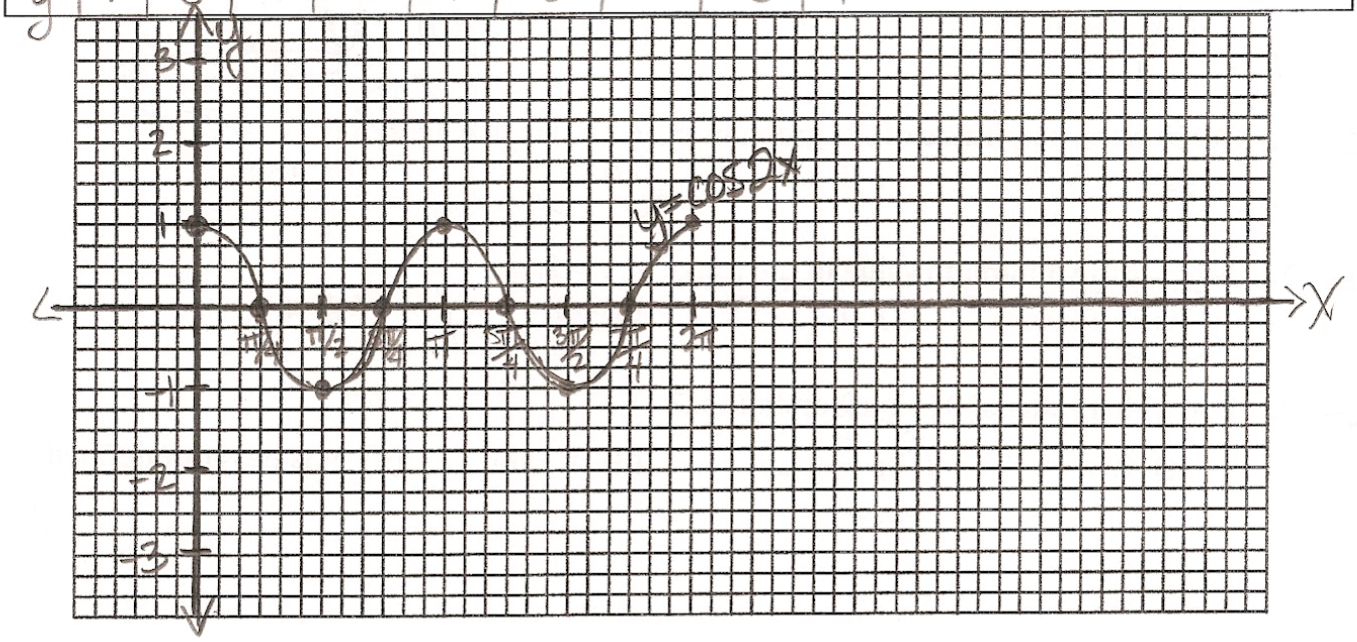
x	-180	-90	0	90	180
y	-1	1	-1	-3	-1



b=2 → count by 45's

10. Graph the equation $y = \cos 2x$ in the interval $0 \le x \le 2\pi$.

x	0	45	90	135	180	225	270	315	360
rad.	0	π/4	π/2	3π/4	π	5π/4	3π/2	7π/4	2π
y	1	0	-1	0	1	0	-1	0	1



in calculator: $y = \sin((1/2)x)$

11. a) On the same set of axes, graph the equations $y = \sin\frac{1}{2}x$ and $y = 3\cos x$ in the interval $0° \le x \le 360°$.

$b=1$ count by 90

$b<1 \rightarrow$ count by 90

b) Use the graph from part **a** to determine how many values of x in the given interval are solutions to the equation $\sin\frac{1}{2}x = 3\cos x$

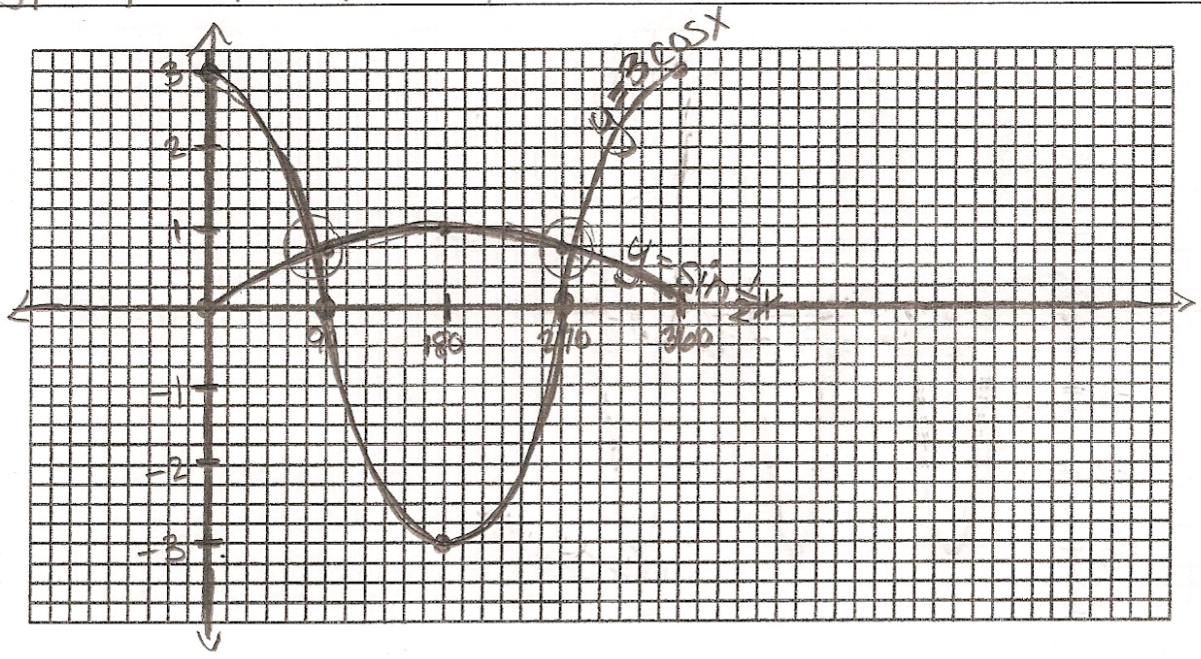
$y=\sin\frac{1}{2}x$

x	0	90	180	270	360
y	0	.7071	1	.7071	0

← decimals are ok here! (it's because b is a fraction)

$y=3\cos x$

x	0	90	180	270	360
y	3	0	-3	0	3



b) 2 values

b=3 → count by 30

12. a) On the same set of axes, graph the equations $y = 3\sin 3x$ and $y = \frac{1}{2}\cos x$ in the interval $0° \le x \le 360°$.

b=1 → count by 90

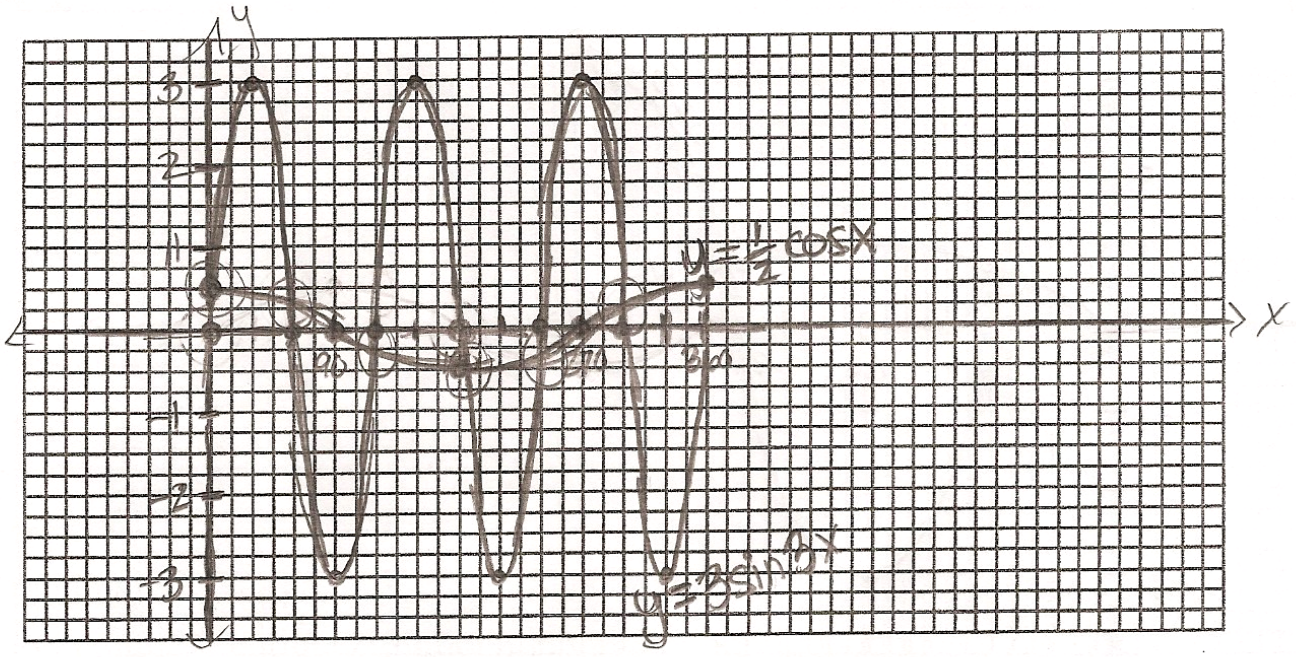
b) Use the graph from part **a** to determine how many values of x in the given interval are solutions to the equation $3\sin 2x = \frac{1}{2}\cos 2x$

$y = 3\sin 3x$

x	0	30	60	90	120	150	180	210	240	270	300	330	360
y	0	3	0	-3	0	3	0	-3	0	3	0	-3	0

$y = \frac{1}{2}\cos x$

x	0	90	180	270	360
y	1/2	0	-1/2	0	1/2



b) 6 values

Part III: For each equation, determine the amplitude, range, frequency, and period.

13. $y = 2\sin(-5x)$

$a = 2$

$R: -2 \le y \le 2$

$b = -5$

$P = \frac{360}{|-5|} = \frac{360}{5} = 72°$

14. $y = 17\cos x$

$a = 17$

$R: -17 \le y \le 17$

$b = 1$

$P = \frac{360}{|1|} = 360°$

15. $y = 4\sin\frac{2}{3}x$

$a = 4$

$R: -4 \le y \le 4$

$b = \frac{2}{3}$

$P = \frac{360}{|\frac{2}{3}|} = 360 \cdot \frac{3}{2} = 540°$

Part IV: Each of the following equations is shifted from the original $y = \cos x$ equation. For each equation, give the direction of the shift (left, right, up, or down), and how many units the graph is shifted.

16. $y = 2\cos(x + 3)$

shift left
3 units

17. $y = \cos 5x - 7$

shift down
7 units

Remember

$y = A\cos(B(x - C)) + D$

horizontal shift:
add or subtract
inside parentheses
- − right
- + left

vertical shift:
add or subtract
outside parentheses
- − down
- + up