Name: ______________________ Date: ______________________

BLM 5–3

Section 5.2 Extra Practice

1. Graph each pair of functions on the same grid. For each, clearly plot the key points.

a) $y = 2 \sin x$ and $y = 2 \sin (x + 45°) - 3$

b) $y = \cos 3x$ and $y = \cos 3\left(x - \frac{\pi}{2}\right) + 1$

c) $y = -\sin \frac{1}{2}x$ and $y = -\sin \frac{1}{2}\left(x + \frac{\pi}{4}\right) - 2$

d) $y = -3 \cos x$ and $y = -3 \cos (x + 60°) - 4$

2. For each function, determine the phase shift and vertical displacement with respect to $y = \cos x$.

a) $y = 0.15 \cos 2(x - 25°) + 3.2$

b) $y = -2 \cos 3\left(x + \frac{\pi}{6}\right) - 7$

c) $y = \cos\left(2x - \frac{\pi}{4}\right) + 5$

d) $y = 6 \cos (3x + 2\pi) - 1$

3. Determine the period and range for each function.

a) $y = 4 \sin 2(x + 30°) - 6$

b) $y = -3 \sin \frac{1}{3}\left(x + \frac{\pi}{3}\right) + 2$

c) $y = 2.3 \sin (5x - 30°) + 4.2$

d) $y = -7 \sin\left(3x + \frac{\pi}{2}\right) - 3$

4. Determine the period and range of $y = a \cos b(x - c) + d$.

5. Given the following characteristics, write the equation of the sine function for each in the form $y = a \sin b(x - c) + d$.

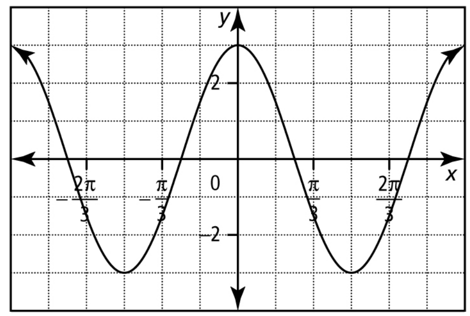
a) phase shift of $\frac{\pi}{2}$, period of $\frac{\pi}{2}$, vertical displacement of 5, and amplitude of 3

b) period of 120°, phase shift of –50°, amplitude of $\frac{1}{2}$, and vertical displacement of –4

c) period of 8π and phase shift of $\frac{\pi}{2}$

d) period of 3π and vertical displacement of 2

6. Consider the graph of $y = 3 \cos 2x$.



Write the equation of this graph as a sine function that has undergone a phase shift left.

7. For the given graph, determine

a) the amplitude

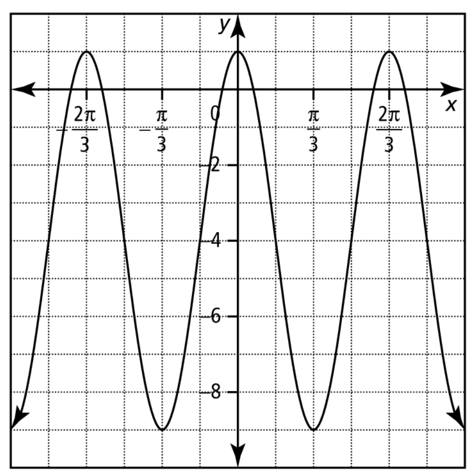
b) the vertical displacement

c) the period

d) its equation in the form $y = a \cos b(x - c) + d$

e) the maximum value of y, and the values of x for which it occurs over the interval $0 \le x \le 2\pi$

f) the minimum value of y, and the values of x for which it occurs over the interval $0 \le x \le 2\pi$



8. Determine an equation of the sine curve with a minimum point at (90°, 4) and its nearest maximum to the right at (120°, 10).