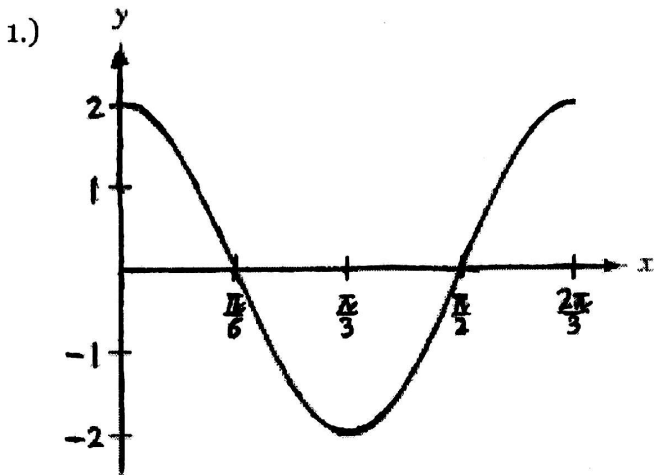
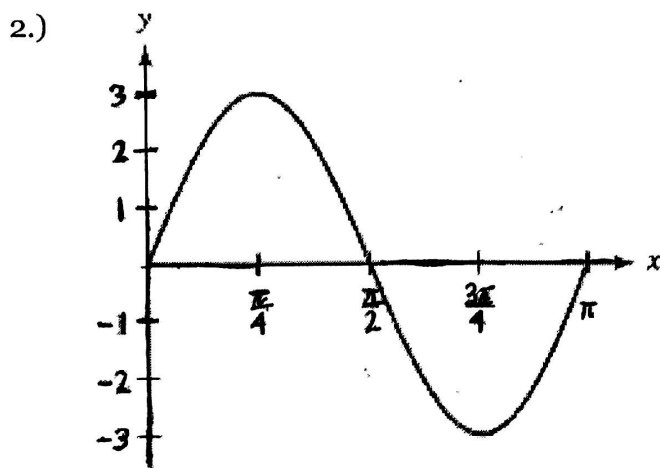


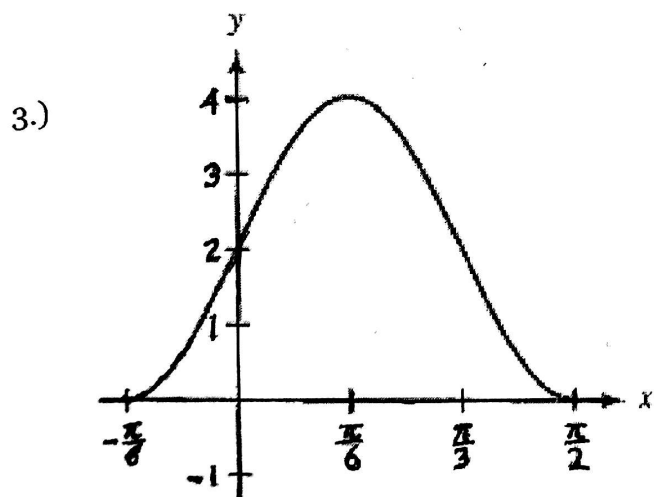
Identify the amplitude, period, and shifts of the following graphs. Then write the equation.



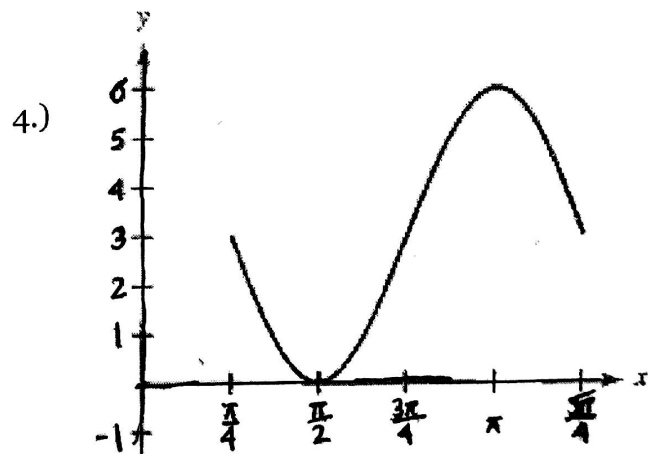
Amplitude: 2 Vertical Shift: 0
 Period: $2\pi/3$ Horizontal Shift: 0
 Equation: $y = 2 \cos 3(x)$



Amplitude: 3 Vertical Shift: 0
 Period: π Horizontal Shift: 0
 Equation: $y = 3 \sin 2(x)$



Amplitude: 2 Vertical Shift: up 2
 $\frac{\pi}{2} + \frac{\pi}{6} = \frac{3\pi}{6} + \frac{\pi}{6}$
 Period: $7\pi/6$ Horizontal Shift: left $\pi/6$
 Equation: $y = -2 \cos \frac{12}{7}(x + \frac{\pi}{6}) + 2$



Amplitude: 3 Vertical Shift: up 3
 Period: π Horizontal Shift: right $\pi/4$
 Equation: $y = -3 \sin 2(x - \pi/4) + 3$

Write equations for sine/cosine given the following changes to the parent graph.

5.) Cosine

Amplitude: 8

Period: 3π

$$B = 2/3$$

Equation: $y = 8 \cos \frac{2}{3}(x)$

6.) Sine

$$\text{Period: } \frac{\pi}{5} \rightarrow B = 10$$

Vertical shift: down 5

Equation: $y = \sin 10(x) - 5$

7.) Cosine

Period: 3 times the parent graph $B = \frac{1}{3}$

Horizontal shift: right $\frac{\pi}{4}$

Vertical shift: up 2

Equation: $y = \cos \frac{1}{3}(x - \frac{\pi}{4}) + 2$

8.) Sine

Amplitude: 6

$$\text{Period: } \frac{\pi}{7} \rightarrow B = 14$$

Horizontal shift: right $\frac{\pi}{2}$

Equation: $y = 6 \sin 14(x - \frac{\pi}{2})$

9.) Cosine

Amplitude: 2

Horizontal shift: left $\frac{\pi}{18}$

Vertical shift: down 5

Equation: $y = 2 \cos(x + \frac{\pi}{18}) - 5$

10.) Sine

Amplitude: $\frac{1}{3}$

$$\text{Period: } 12\pi \rightarrow B = \frac{1}{6}$$

Horizontal shift: left $\frac{5\pi}{12}$

Vertical shift: up 4

Equation: $\frac{1}{3} \sin \frac{1}{6}(x + \frac{5\pi}{12}) + 4$