1 Section 5.7 Graphing Techniques

Translation of Trigonometric Functions

The graph of $y = f(x) - c$ is shifted c units down from the graph of $y = f(x)$. The graph of $y = f(x) + c$ is shifted c units up from the graph of $y = f(x)$.

The graph of $y = f(x - d)$ is shifted d units to the right from the graph of $y = f(x)$. The graph of $y = f(x + d)$ is shifted d units to the left from the graph of $y = f(x)$.

The graph of $y = a\sin(bx + c)$ and $y = a\cos(bx + c)$, with $b > 0$ have

Amplitude: $|a|$ Period: $\frac{2\pi}{b}$ **Phase Shift**: $-\frac{c}{b}$

One cycle of each graph is completed on the interval $-\frac{c}{b} \leq x \leq -\frac{c}{b} + \frac{2\pi}{b}$.

Example 1 *Graph the following:* $1) y = 2\cos(3x - 2)$ $2) y = 3\cot(2x + \pi)$ $3) y = 2\sin(4x + \pi) + 1$ $4) y = -2\cos(\pi x + \frac{\pi}{2}) + 1$ $5) y = 3\csc(x + 2\pi)$.

Example 2 *Find an equation of the following graphs*