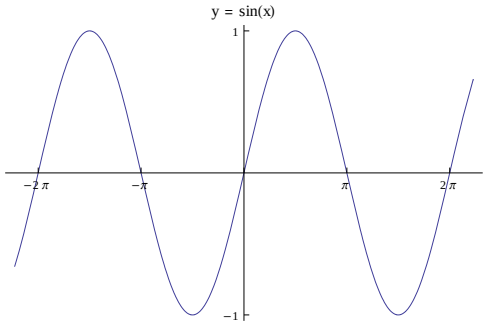
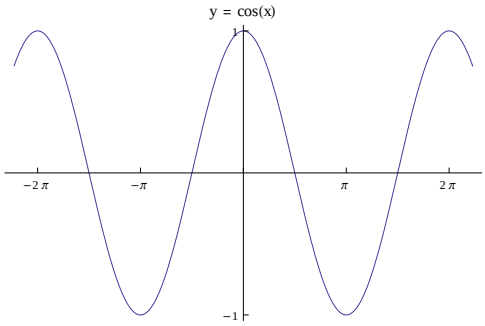
MT 1800 – Calculus I
Worksheet 1.5
Review of Sine and Cosine Functions

Recall the graphs of the sine and cosine function:

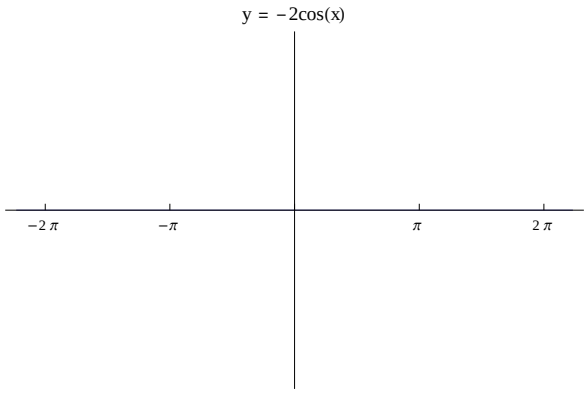




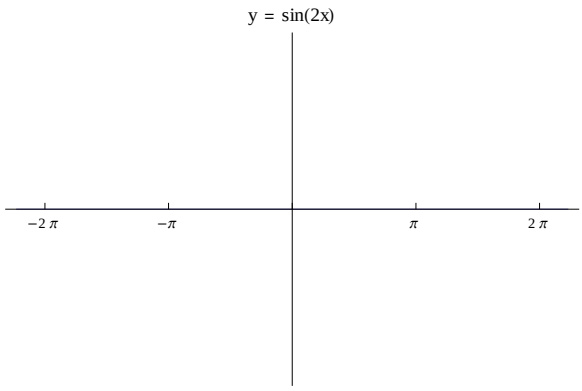
The sine and cosine function have period _____ and amplitude _____.

Modifications of the graphs. We would like to be able to graph $y = A\sin(Bx)$ and $y = A\cos(Bx)$.

Example: Sketch the graph of $y = -2\cos(x)$.



Example: Sketch the graph of $y = \sin(2x)$.



In general, for $y = A\sin(Bx)$ and $y = A\cos(Bx)$, we have:

Amplitude = _____

Frequency = _____

Period = _____

Sine and cosine are useful for modeling data that is periodic (repeats a pattern).

Example:

The Bay of Fundy in Canada has the largest tides in the world. The difference between low and high water levels is 23 meters. The average depth of the water is 5 meters. At a particular point the depth of the water, *y* meters, is given as a function of time, *t*, in hours since midnight by the following
$y = D + A\cos(B(t - C))$

(a) What is the physical meaning of *D*?

- the average depth of the water
- the time of low tide
- the depth of the water at high tide
- the time of high tide
- none of these
- the depth of the water at low tide

(b) What is the value of *A*? _____

(c) What is the value of *B*? Assume the time between successive high tides is 12.8 hours. _____

(d) What is the physical meaning of *C*?

- the depth of the water at high tide
- none of these
- the time of low tide
- the depth of the water at low tide
- the time of high tide
- the average depth of the water

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

Model: _____