

Fall 2009 Math 151

Week in Review I

courtesy: David J. Manuel

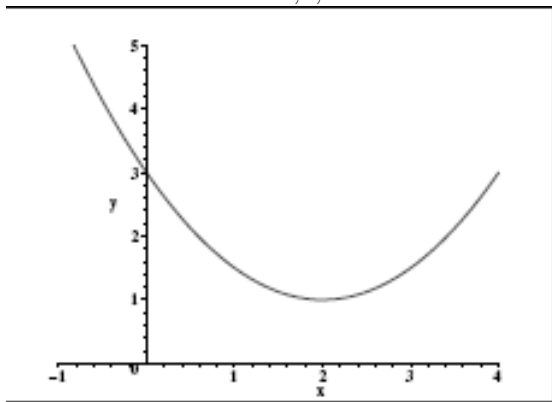
(covering ch 0, Appendix D, and 1.1)

1 Section 0.1

1. Find the domain of the function $f(x) = \sqrt{2x - 3}$.
2. Find the domain of the function $g(x) = \frac{x + 6}{x^2 - 3x - 4}$.
3. Let $g(t) = t^2 - t + 3$. Compute and expand $g(t + h) - g(t)$.
4. Let $f(x) = \sqrt{x + 1}$ and $g(x) = x^2 - 2$. Compute $f(g(x))$ and $g(f(x))$ and state the domain of each.
5. A box with a square base and no top has a volume of 40 cubic centimeters. Write the surface area of the box as a function of:
 - a) its width
 - b) its height

2 Section 0.2

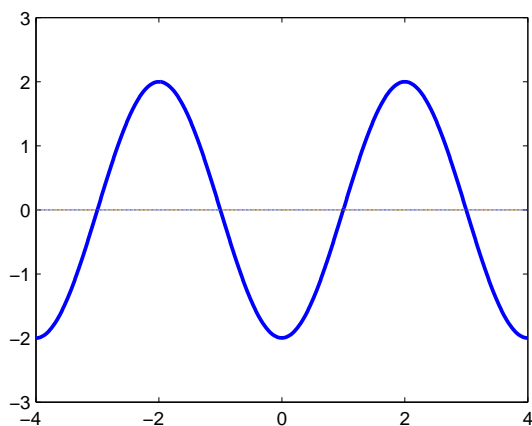
1. The graph of $f(x) = ax^2 + bx + c$ is shown below. Find a, b , and c .



2. “Shifting Functions” Maplet located at <http://calclab.math.tamu.edu/maple/maplets/> (only works on OAL machine, Calclab machine, or any machine with Maple installed on it)

3 Appendix D

1. Let θ be an angle in a right triangle. If $\sin \theta = \frac{1}{3}$, find $\cot \theta$.
2. Let θ be an angle in a right triangle. If $\sin^2 \theta = \frac{1}{3}$, find $\tan^2 \theta$.
3. Given $\cos \theta = \frac{2}{5}$ and $\sin \theta < 0$, find $\tan \theta$.
4. Sketch the graph of $f(x) = -3 \sin\left(\frac{\pi}{3}x\right)$ over two periods starting at $x = 0$.
5. The graph of $f(x) = A \cos(bx)$ is shown below. Find A and b .



6. Use identities to write $\sin^5 x$ in the form $\sin x P(\cos x)$, where P is a polynomial function.
7. Find all values of x between 0 and 2π for which $\sin x = \sin 2x$.

4 Section 1.1

1. Find a vector which represents the directed line segment from $A(3, 5)$ to $B(-4, -1)$. Sketch \overline{AB} and the vector in its standard position.
2. Find a unit vector parallel to the vector from the point $(5, 2)$ to the point $(-1, 3)$.
3. Given $\mathbf{a} = \langle 5, 2 \rangle$ and $\mathbf{b} = -2\mathbf{i} + 4\mathbf{j}$, find $\mathbf{a} - \mathbf{b}$ and $3\mathbf{a} + 4\mathbf{b}$.
4. Two people are to pull ropes attached to a 50 kg box (on a frictionless surface). The rope to the left of the box makes an 60° angle with the box and is pulled with a force of 6 N. The rope to the right makes a 45° angle with the box and is pulled with a force of 10 N. Determine how fast the box accelerates and at what angle from the vertical.
5. (See Figure 11 on p52 for diagram). A 50-lb weight hangs from two wires. Find the magnitudes of the tensions in each wire.