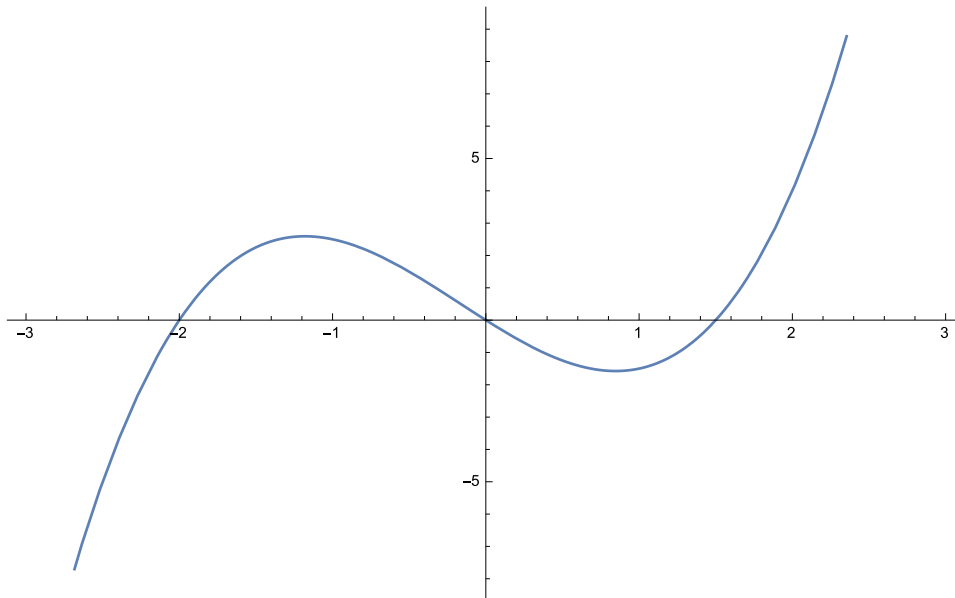


Math 110, Spring 2016
HWK00 due Jan 20

1. A graph of the function f is shown. On the same graph, sketch the functions

- (a) $f(x + 1)$;
- (b) $f(x/2)$;
- (c) $f(x) - 2$;
- (d) $(2/3)f(x)$.

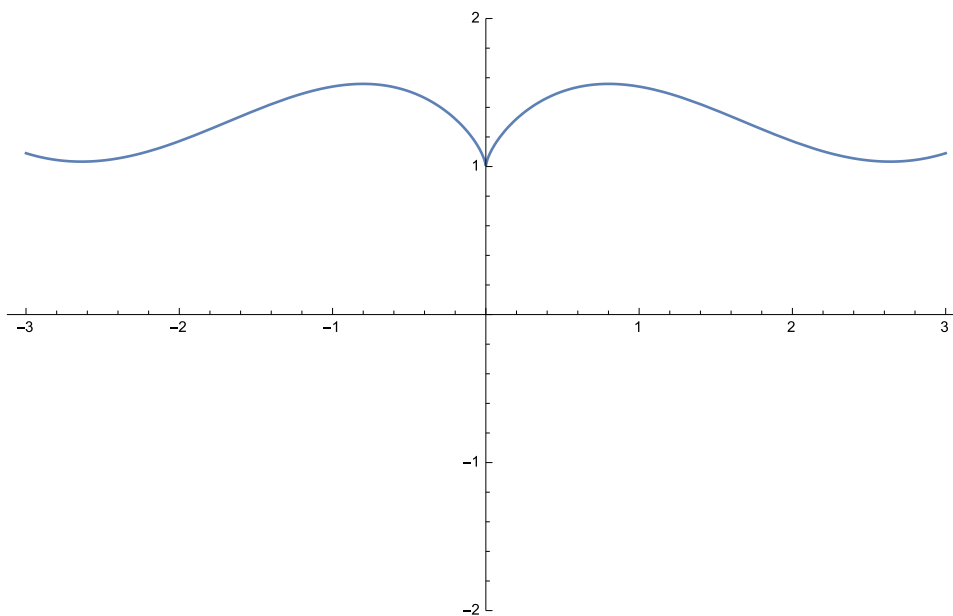


2. A graph of the function $\cos(x) + x^{2/3}$ is shown. On the same graph, sketch the functions

(a) $\cos(x - 1) + (x - 1)^{2/3}$;

(b) $\cos(2x) + (2x)^{2/3}$;

(c) $\cos(x) + x^{2/3} - 2$;



3. Sketch the following functions on enough of the domain to get an idea of the shape of the graph.

(a) $\sin(x^2)$

(b) $\sin(x)/x$

(c) xe^{-5x}

(d) $x - \lfloor x \rfloor$

4. Within a species, the surface area of an animal (which determines how rapidly it loses heat) is proportional to the square of its length and the mass of the animal is proportional to the cube of its length.

If a mouse doubles in mass, by what factor would you expect the surface area to increase?

5. The value of a used car that has been owned for a time t is modeled as

$$\begin{cases} V(t) = V_0 & t = 0 \\ V(t) = (1 - \beta)V_0e^{-kt} & t > 0 \end{cases}$$

(a) What are the units of β and k and what are their interpretations?

(b) If the Kelly Blue book lists a Prius as worth \$27,000, \$18,000, and \$13,500 when new, two years old and four years old respectively, what is β ?