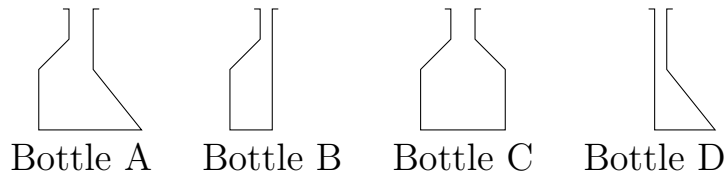


1. State an example of each of the following kinds of function. Then, draw a sketch of each kind of functions. The sketch does not need to correspond to your example.

- (a) linear
- (b) quadratic
- (c) absolute value
- (d) polynomial

2. Sketch calibration functions for the following bottles. However, before making your sketches, describe how Bottles B and C are related, and also describe how Bottles A, B, and D are related. Explain how you can use this to simplify your sketching process.



**3.** Sketch  $f(x)$  and  $g(x)$  by making tables of values.

$$f(x) = x^3 - 3x + 1 \quad g(x) = |x^2 - 2x - 1|$$

**4.** Let  $\ell(x) = 2x + 1$ . Describe how the graph of  $\ell(f(x))$  can be obtained from the graph of  $f(x)$  (hint: break  $\ell(x)$  into two steps). Also describe how the graph of  $f(\ell(x))$  is related to the graph of  $f(x)$ .

**5.** For the following pairs of linear functions, compute  $\ell(x) + m(x)$ ,  $\ell(m(x))$ , and  $m(\ell(x))$ . Do you notice anything? (see Question 6)

(a)  $\ell(x) = 2x + 1$  and  $m(x) = -3x - 5$

(b)  $\ell(x) = 10x + 22$  and  $m(x) = 7 - x$

**6.** Let  $\ell(x)$  and  $m(x)$  be two linear functions. Explain how the slopes of  $\ell(x) + m(x)$  and  $\ell(m(x))$  can be obtained from the slopes of  $\ell(x)$  and  $m(x)$ .