



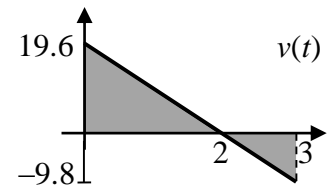
## Examples 2.6 – Integrals of Linear and Quadratic Functions

1. Find three quadratic functions that have  $x + 2$  as a derivative, and sketch them on the same set of axes. Then find the family of antiderivatives  $\int (x + 2) dx$ .

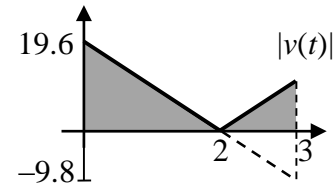
**Solution:**

2. A projectile is fired upward from a 15.3 m cliff and allowed to fall into a valley below. The velocity of the projectile at time  $t$  is given by  $v(t) = -9.8t + 19.6$  m/s. Find the displacement and total distance traveled on  $[0, 3]$  using integration. Compare with Example 1.5.2(b).

**Solution:** Displacement:



Total Distance Traveled:



3. If  $h'(t) = 4.2t$  is the rate of increase of the number of acres consumed by a forest fire per day, then what does  $\int_2^7 h'(t) dt$  represent, and what are its units? Calculate the integral.

**Solution:**