

# 1: Motion

We have already developed three equations for velocity and acceleration:

$$\bar{v} = \frac{d}{t} \quad \bar{v} = \frac{v_f + v_i}{2} \quad a = \frac{v_f - v_i}{t}$$

Using these equations, figure out ways to combine them algebraically to make five other equations that would enable you to:

1. Solve for  $v_f$  when you know  $v_i$ ,  $a$ , and  $t$ .
2. Solve for  $d$  when you know  $v_i$ ,  $a$ , and  $t$ .
3. Solve for  $a$  when you know  $v_i$ ,  $d$ , and  $t$ .
4. Solve for  $t$  when you know  $d$  and  $a$ , and  $v_i=0$ .
5. Solve for  $v_f$  when you know  $v_i$ ,  $a$ , and  $d$ .