Week 3: **Vectors**

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Review: Motion in 1D with Constant Acceleration

$$v(t) = v_i + at \tag{1}$$

$$x(t) = x_i + v_i t + \frac{1}{2}at \tag{2}$$

$$v(t)^2 = v_i^2 + 2a(x(t) - x_i) \tag{3}$$

$$x(t) = x_i + \frac{1}{2}(v_i + v(t))t \tag{4}$$

$$x(t) = x_i + v_i - \frac{1}{2}at^2 \tag{5}$$

Note: $x_i = x(t = 0)$, and similarly for v_i.

1 Vectors in Physics 40

2 Optimal Throwing Angle

You'd like to throw a baseball as far as you can. Knowing what you know about vectors, determine at what angle you should throw the ball to have it travel the furthest distance.