

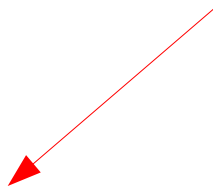
# Vector Equations

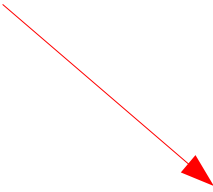
- For vectors to be equal, every component must be equal
- We can write equations with vectors: these stand for equations in every component!
- Ex:  $\Delta \vec{r} = \vec{v}_0 t + \frac{1}{2} \vec{a} t^2$

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$$\Delta x = v_{0x} t + \frac{1}{2} a_x t^2$$


$$\Delta y = v_{0y} t + \frac{1}{2} a_y t^2$$

# Projectile Motion

- Can use constant acceleration equations since projectile is only accelerating due to gravity
- x and y parts of motion are independent, only tied together by time t
  - Projectile problems often require solving systems of equations, some x, some y
- Useful result: range equation (flat ground only!)

$$x = \frac{v_0^2}{g} \sin(2\theta)$$