

Free Fall Example

Fred throws a ball 30 m/s vertically upward. What is the maximum height the ball reaches? How long does it take to reach this height?

$$v^2 - v_0^2 = 2 a \Delta y$$

$$\Delta y = (v^2 - v_0^2) / (2 a)$$

$$= -30^2 / (2 * -9.8)$$

$$= 46 \text{ m.}$$

$$v = v_0 + a t$$

$$t = (v - v_0) / a$$

$$= (0 - 30 \text{ m/s}) / (-9.8 \text{ m/s}^2)$$

$$= 3.1 \text{ seconds}$$