Answer on Question #73345 - Physics / Other

A ball is thrown upward with a velocity of $v_{\text{initial}} = 50$ m/s.

a. How long does it take to reach the top?

b. What is the speed at the top?

c. What is the acceleration at this point?

d. How high does it go?

Solution:

(a) The time taken for the ball to reaches the top

$$t = \frac{v_{\text{initial}}}{g} = \frac{50}{9.8} = 5.1 \text{ s}$$

(b) At the top the ball is at rest, so

$$v_{\text{final}} = 0$$

(c) The acceleration of the ball due to the gravity

$$a = g = 9.8 \frac{\text{m}}{\text{s}^2}$$

(d) The maximum high

$$h_{\max} = \frac{v_{\text{initial}}^2}{2g} = \frac{50^2}{2 \times 9.8} = 127.6 \text{ m}$$

Answers:

a) $t = 5.1$ s
b) $v_{\text{final}} = 0$ m/s
c) $a = 9.8 \frac{\text{m}}{\text{s}^2}$
d) $h_{\max} = 127.6$ m