28. We adopt the positive direction choices used in the textbook so that equations such as Eq. 4-22 are directly applicable. The coordinate origin is at the release point (the initial position for the ball as it begins projectile motion in the sense of §4-5), and we let θ_0 be the angle of throw (shown in the figure). Since the horizontal component of the velocity of the ball is $v_x = v_0 \cos 40.0^\circ$, the time it takes for the ball to hit the wall is

$$t = \frac{\Delta x}{v_x} = \frac{22.0}{25.0 \cos 40.0^\circ} = 1.15 \text{ s} .$$

(a) The vertical distance is

$$\begin{aligned} \Delta y &= (v_0 \sin\theta_0)t - \frac{1}{2}gt^2 \\ &= (25.0 \sin 40.0^\circ)(1.15) - \frac{1}{2}(9.8)(1.15)^2 = 12.0 \text{ m} . \end{aligned}$$

(b) The horizontal component of the velocity when it strikes the wall does not change from its initial value: $v_x = v_0 \cos 40.0^\circ = 19.2$ m/s, while the vertical component becomes (using Eq. 4-23)

$$v_y = v_0 \sin\theta_0 - gt = 25.0 \sin 40.0^\circ - (9.8)(1.15) = 4.80 \text{ m/s} .$$

(c) Since $v_y > 0$ when the ball hits the wall, it has not reached the highest point yet.