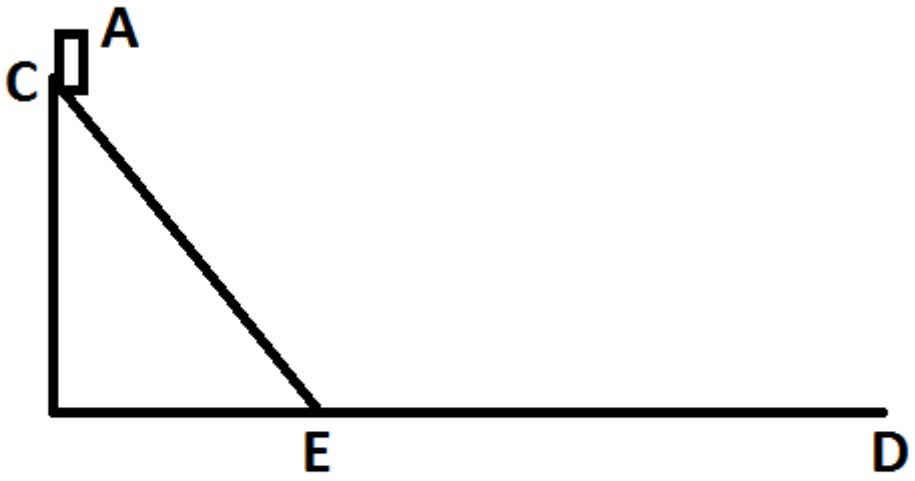
Answer on Question#49048 – Engineering – Other

$$\sqrt{58.8} \approx 7.668 \frac{m}{s}$$

Solution



Consider suitcase A is not rotating. Thus, as soon as ramp CE – frictionless, we can write next conservation law: $mg(h_1 - h_0) + \frac{mV_1^2}{2} = mg(h_2 - h_0) + \frac{mV_2^2}{2}$, where m – mass of suitcase. h, V – It's height and velocity respectively. h_0 – ground level. Note: there is no influence of ramp's angle, the only thing that matter is initial height.

Consider: $g = 9.8 \frac{m}{s^2}$; height at point $E \equiv h_2 \equiv h_0 = 0$; Initial velocity of suitcase $V_1 = 0$; $h_1 \equiv h;\ V_2 \equiv V$.

Hence,

$$mgh = \frac{mV^2}{2};\quad gh = \frac{V^2}{2};\quad V = \sqrt{2gh}$$

h – height at point C. V – velocity at point E.

$$V = \sqrt{2 * 9.8 * 3} = \sqrt{58.8} \frac{m}{s}$$