



We can use conservation of linear momentum:

$$(1) \quad m_p \cdot V_1 = m_p \cdot V_1 \cdot \frac{1}{3} + m_q \cdot V_2,$$

where  $m_p = m_q = 0.5 \text{ kg} = \frac{1}{2} \text{ kg}$  – mass of the first ball;

$V_2 = 20 \frac{\text{m}}{\text{s}}$ , speed of the second ball "q" after collision.

$V_1$  – speed of the first ball p

$$m_p \cdot V_1 - \frac{m_p}{3} \cdot V_1 = V_2 \cdot m_q$$

Let's put values  $V_2$  and  $m_q$ ,  $m_p$  into equation. We will have:

$$0.5 \cdot V_1 - 0.16 \cdot V_1 = 10$$

$$0.34 \cdot V_1 = 10$$

$$\text{ANSWER: } V_1 = 29.4 \text{ m/s}$$