Question#19489

a ball is rolling on the horizantal travels 12m and comes to a complete stop. the ball is subject to an acceleration of -1.2m/s squared. calulate original velocity, time to stop, and average velocity

Solution:

Let:

$S = 12\ m$

$a = -1.2\ m/s^2$

$v-?, t-?, v_{average}-?$

Such as:

$S = \frac{1}{2}at^2, \boldsymbol{t = \sqrt{\frac{2S}{a}}}$

*acceleration by value, without " - "

$v = at, \boldsymbol{v = \sqrt{2aS}}$

$v_{average} = \frac{v}{t} = \frac{\sqrt{2aS}}{\sqrt{\frac{2S}{a}}}, \boldsymbol{v_{average} = a}$ * by value

$\boldsymbol{t = \sqrt{\frac{2*12}{1.2}} = 4.47\ s}$

$\boldsymbol{v = \sqrt{2 * 1.2 * 12} = 5.37\ m/s}$

$\boldsymbol{v_{average} = 1.2\ m/s}$