Calculate the speed of an 8.0 x 10(to the 4th)kg airliner with a kinetic energy of 1.1 x 10(to the 9th) J.

Solution.

$$m = 8 \cdot 10^4 kg, E_k = 1.1 \cdot 10^9 J;$$

$$\upsilon - ?$$

The kinetic energy of the airliner we calculate by formula:

$$E_k = \frac{m\upsilon^2}{2};$$

E_k - the kinetic energy of the airliner;

m – the mass of the airliner;

υ – the speed of the airliner.

$$2E_k = m\upsilon^2;$$

$$\upsilon^2 = \frac{2E_k}{m}.$$

$$\upsilon = \sqrt{\frac{2E_k}{m}}.$$

$$\upsilon = \sqrt{\frac{2 \cdot 1.1 \cdot 10^9}{8 \cdot 10^4}} = 165.83 \left(\frac{m}{s}\right).$$

Answer: The speed of the airliner is $\upsilon = 165.83 \frac{m}{s}$.