Remember to show all your calculations, including SI units.

Formulas

\[ d_y = v_{iy} t + \frac{1}{2} at^2 \quad d_x = v_x t \]

Givens:

- **Vertical Motion**
  - \( a = -9.8 \text{ m/s}^2 \) (- because it is falling)
  - \( d_y = 15 \text{ m} \)
  - \( v_{iy} \) (initial vertical velocity) = 0 m/s
  - \( t = ? \)

- **Horizontal Motion**
  - \( d_x = 10 \text{ m} \)
  - \( v_x = 6 \text{ m/s} \)
  - \( t = ? \)

**Remember, in physics + and − are used to indicate direction.**

**Up and right** are usually considered + directions, so an object moving to the right us usually described as moving in the positive (+) x-direction.

**Down and left** are usually considered – directions, so a falling object is usually described as moving in the negative (-) y-direction.
\[ d_y = v_{iy} \cdot t + \frac{1}{2} at^2 \]
\[ d_y = 0 \cdot t + \frac{1}{2} at^2 \]
\[ d_y = \frac{1}{2} at^2 \]
\[ \frac{d_y}{a} = \frac{1}{2} t^2 \]
\[ 2(\frac{d_y}{a}) = t^2 \]
\[ 2(\frac{d_y}{a}) = t^2 \]

\[ t = \sqrt{\frac{2d_y}{a}} \]

\[ t = \sqrt{\frac{2(-15 \text{ m})}{-9.8 \text{ m/s}^2}} \]

\[ t = 1.75 \text{ s} \]

(b) Determine whether the skater will travel far enough to complete the trick successfully.

\[ d_x = v_x t \]
\[ d_x = (6 \text{ m/s}) \cdot (1.75 \text{ s}) \]

\[ d_x = 10.5 \text{ m} \]

Yes, the skater will clear the boxes by 0.5 meters.