## Answer on Question \#72506-Physics-Other

A ball is thrown upward from the top of a 50 m high building with an initial velocity of $20 \mathrm{~m} / \mathrm{s}$ at the same instant, another ball is thrown upward with an initial velocity of $30 \mathrm{~m} / \mathrm{s}$ from the ground. Determine
a) When and where they will meet each other
b) The velocity of each ball at that instant

Hint: $s=y$-yo
Note: Set the ground as a reference point for Ball $A$ and Ball B. The final position of ball $A$ is equal to the final position of ball $\mathrm{B} . \mathrm{Ya}=\mathrm{Yb}$

## Solution

a)

$$
\begin{gathered}
y_{a}=50+20 t-\frac{10 t^{2}}{2} \\
y_{b}=30 t-\frac{10 t^{2}}{2} \\
50+20 t-\frac{10 t^{2}}{2}=30 t-\frac{10 t^{2}}{2} \\
10 t=50 \\
t=\frac{50}{10}=5 \mathrm{~s} . \\
y=30(5)-\frac{10(5)^{2}}{2}=25 \mathrm{~m} .
\end{gathered}
$$

b)

$$
\begin{aligned}
& v_{a}=20-10(5)=-30 \frac{\mathrm{~m}}{\mathrm{~s}} . \\
& v_{a}=30-10(5)=-20 \frac{\mathrm{~m}}{\mathrm{~s}} .
\end{aligned}
$$

The negative sign means that direction is downwards.

