A water trough is 12 m long and has a cross-section in the shape of an isosceles trapezoid that is 8 m wide at the top, 2 m wide at the bottom, and has a height of 5 m. If the trough is being filled with water at the rate of 0.3 cubic meters per minute, how fast is the water level rising when the water is 4 m deep?

![Diagram of water trough with dimensions and water level]

Given: \( \frac{dV}{dt} = 0.3 \)  Find \( \frac{dh}{dt} \) \( h = 4 \)

By similar triangles,
\[
\frac{3}{5} = \frac{a}{h}
\]
\[a = \frac{3}{5} h\]

Volume of the trough:
\[V = (A_{\text{rectangle}} + 2A_{\text{triangle}})(12)\]
\[V = (2h + 2 \cdot \frac{1}{2} a \cdot h)(12)\]
\[= (2h + 0h)(12)\]
\[= (2h + \frac{3}{5} h^2)(12)\]

\[V = 24h + \frac{36}{5} h^2\]

\[\frac{dV}{dt} = 24 \frac{dh}{dt} + \frac{72}{5} h \frac{dh}{dt}\]

\[0.3 = 24 \frac{dh}{dt} + \frac{72}{5} \cdot 4 \frac{dh}{dt}\]

\[0.3 = \frac{408}{5} \frac{dh}{dt} \Rightarrow \frac{dh}{dt} = \frac{1}{272} \frac{m}{s}\]