2.92. An open container of oil rests on the flatbed of a truck that is traveling along a horizontal road at 55 mi/hr. As the truck slows uniformly to a complete stop in 5 s, what will be the slope of the oil surface during the period of constant deceleration?

\[
\text{slope} = \frac{dz}{dy} = - \frac{a_y}{g + q_z} \quad (Eg. 2.28)
\]

\[
a_y = \frac{\text{final velocity} - \text{initial velocity}}{\text{time interval}}
\]

\[
= \frac{0 - (55 \text{ mph})(0.4470 \text{ m/s})}{5 \text{ s}} = -4.92 \text{ m/s}^2
\]

Thus,

\[
\frac{dz}{dy} = - \frac{(-4.92 \text{ m/s}^2)}{9.81 \text{ m/s}^2 + 0} = 0.502
\]