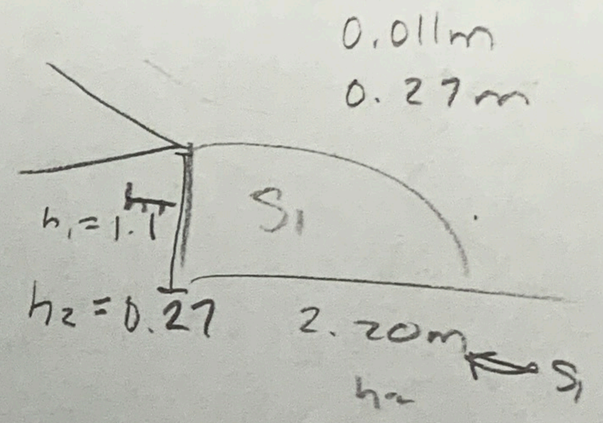
Show - work

#10. $mgh_1 = \frac{1}{2}mv_1^2$, $v_1 = \sqrt{2gh_1}$

$mgh_2 = \frac{1}{2}mv_2^2$, $v_2 = \sqrt{2gh_2}$



$h_2 = 0.27m$
$h_1 = 0.011m$
$S_1 = 2.20$
$S_2 = ?$

$S_1 = V_1 t$
$S_2 = V_2 t$

Ratio: $\frac{S_1}{S_2} = \frac{V_1 t}{V_2 t} \rightarrow S_2 = \frac{S_1 V_2}{V_1} = S_1\sqrt{\frac{h_2}{h_1}}$

$\Rightarrow S_2 = S_1\sqrt{\frac{h_2}{h_1}}$

$S_2 = \frac{2.20\left(\sqrt{2\times10\times0.011}\right)}{\left(\sqrt{2\times10\times0.27}\right)}$

$\Rightarrow S_2 = (2.20m)\left(\sqrt{\frac{0.27}{0.011}}\right)$

$= 10.8995m$

$= 0.444m$

#5. ☆ $Q = (2)(10°C)(2480) = -43600 J/kg$

$Q = m(\text{Latent heat})$

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$C_{steam} = 1996 J/kg°C$

$L_{steam} = 2336000 J/kg$

$L_{water} = 334,00 J/kg$

$C_{water} = 4186 J/kg°C$

$Q_{net} = m(4186\times10 + 2336000 + 1996\times1000 + 334000\times1000)$