# STUDYDADDY

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**Problem #1**

A trapezoidal channel has the following characteristics: $b = 4.5$ ft, $m = 2$, $n = 0.022$, $S_c = 0.0001$, $Q = 350$ cfs. Determine if this channel is mild, steep, horizontal, critical, or adverse.


**Problem #2**

Both channels shown in the diagram are trapezoidal, infinitely long, and have a bottom width of 5 ft and sides slopes of 2. The discharge is 300 cfs. Determine the type of water surface profiles in these channels if $n_1 = n_2 = 0.013$, $S_{01} = 0.0004$, and $S_{02} = 0.01$.

$Q$

$n_1, S_{01}$

$n_2, S_{02}$


**Problem #3**

Suppose the two channels shown in Problem #2 are very long and rectangular in cross-section, with a bottom width of 10 ft and a Manning roughness factor of 0.013. The longitudinal bottom slopes are 0.02 and 0.0002 for channels 1 and 2, respectively and the discharge is 400 cfs. Will a hydraulic jump occur? If your answer is "no", explain it fully. If your answer is "yes", find the distance between the channel bottom slope transition point and the hydraulic jump.

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