

Don't know

**Assignment: Due Date : Next lecture.**

1. Find the normal and critical depths for the following:

A trapezoidal channel with  $Q = 1000$  cfs;  $b = 10$  ft;  $n = 0.03$ ;  $z = 2$  and  $S_o = 0.0005$ .

2. Find the bottom width for the following:

A trapezoidal channel with  $Q = 1000$  cfs;  $y_n = 8$  ft;  $n = 0.03$ ;  $z = 2$  and  $S_o = 0.0005$ .

*[Handwritten notes and calculations for problem 1 and 2, including formulas for discharge, area, and depth. The notes are partially illegible but show the following steps:]*

For problem 1, the discharge equation is used:  $Q = \frac{1.49}{n} A R^{4/3} S_o^{1/2}$ . The area  $A$  for a trapezoidal channel is  $A = (b + zy)y$ . The hydraulic radius  $R$  is  $R = \frac{A}{P}$ , where  $P$  is the wetted perimeter. The calculations involve solving for  $y$  iteratively.

For problem 2, the discharge equation is used with the normal depth  $y_n = 8$  ft. The goal is to solve for the bottom width  $b$ .

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2)

-  $\mu = 100$ ,  $\sigma = 10$ ,  $n = 0.03$ ,  $z = 2$ ,  $\alpha = 0.05$

$$1 - \frac{\alpha}{2} = 0.975 = \frac{1}{\sqrt{0.03}} \left( \frac{100 - \mu}{10} + z \right) \quad 902.5 = 18 \left( \frac{100 - \mu}{10} + 2 \right)$$

$$= \frac{902.5}{18} = 50.1389 = \frac{100 - \mu}{10} + 2 \quad \frac{902.5}{18} - 2 = \frac{100 - \mu}{10} \quad \left[ \frac{902.5}{18} - 2 \right] \cdot 10 = 100 - \mu$$

$$\rightarrow 100 - \mu = \left[ \frac{902.5}{18} - 2 \right] \cdot 10 = 30.1389$$

$$\mu = 100 - 30.1389 = 69.8611$$