Manual Fitting (FOPDT)

1. Find $\theta_p$
2. Find $y_\infty$
3. Find $\Delta y_{\text{max}}$
4. Find $y_{0.632}$
5. Find $t_{0.632}$
6. Find $\tau_p$
7. Find $K_p = \Delta y_{\text{max}} / \Delta u$
Loop-Pro: Gravity Drained Tanks

Process: Gravity Drained Tank

Cont.: Manual Mode

![Graph showing process variable/setpoint over time in a gravity drained tank system.]

- **Y-axis:** Process Variable/Setpoint
  - Values range from 4.2 to 0.48
- **X-axis:** Time (mins)
  - Ranges from 0 to 10 minutes

The graph illustrates the process variable/setpoint decay over time, representing the tank's draining process.
1. Find $\theta_p = 0.505$
2. Find $y_\infty$  

$y_\infty = 1.94$

3. Find $\Delta y_{\text{max}}$

$\Delta y_{\text{max}} = 1.94 - 4 = -2.06$

$y_0 = 4$
4. Find \( y_{0.632} \)

5. Find \( t_{0.632} \)

\[
0.632 \Delta y_{\text{max}} = (0.632) \times (2.06) = 1.30 \text{ m}
\]

\[
y_{0.632} = 4 - 1.30 = 2.70 \text{ m}
\]

\[
t_{0.632} = 4.5 \text{ min}
\]

\[
\tau_p = 4.5 - 3.05 = 1.45 \text{ min}
\]

Caution: Account for dead time when calculating \( \tau_p \)!
7. Find $K_p$

• $K_p = \frac{\Delta y_{\text{max}}}{\Delta u} = -2.06 \text{ m/}-15\%$

= 0.137 \text{ m/}%