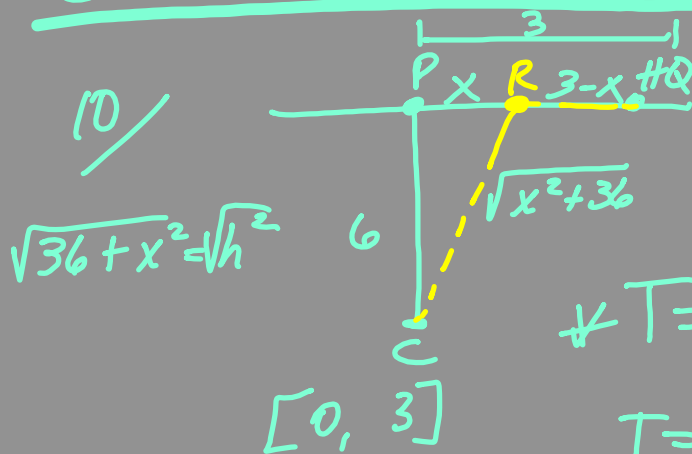


# OPTIMIZATION 3



Minimize time.

$$T = \frac{D}{R} \quad R = \frac{D}{T}$$

$$R \cdot T = D$$

$$T = \frac{\sqrt{x^2 + 36}}{14} + \frac{3-x}{50}$$

$$T = \frac{1}{14}(x^2 + 36)^{1/2} + \frac{3-x}{50}$$

$$T(0) = 0.489$$

$$T(7/4) = 0.971$$

$$T(3) = 0.479$$

$1\frac{3}{4}$  mi from P.

$$T' = \frac{1}{14}(x^2 + 36)^{-1/2} \cdot 2x - \frac{1}{50} = 0$$

$$\frac{x}{14\sqrt{x^2 + 36}} = \frac{1}{50}$$

$$\frac{50x}{14} = \frac{14\sqrt{x^2 + 36}}{14}$$

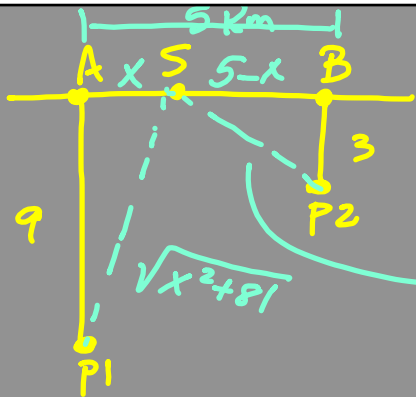
$$\left(\frac{25}{7}x\right)^2 = (\sqrt{x^2 + 36})^2$$

$$\frac{625}{49}x^2 = x^2 + 36$$

$$\sqrt{\frac{576}{49}x^2} = \sqrt{36}$$

$$\frac{24}{7}x = \pm 6 \cdot \frac{7}{24}$$

$$x = \pm \frac{7}{4}$$



$$D = \sqrt{x^2 + 81} + \sqrt{9 + (5-x)^2}$$

$$D' = \underline{\hspace{2cm}}$$

Solve(  $\underline{\hspace{2cm}} = 0, x$  )

$x = \underline{\hspace{2cm}}$

$[0, 5]$

$D$		$x=0$
$\underline{\hspace{1cm}}$		$x=5$
$\underline{\hspace{1cm}}$		$x = \text{crit pt.}$