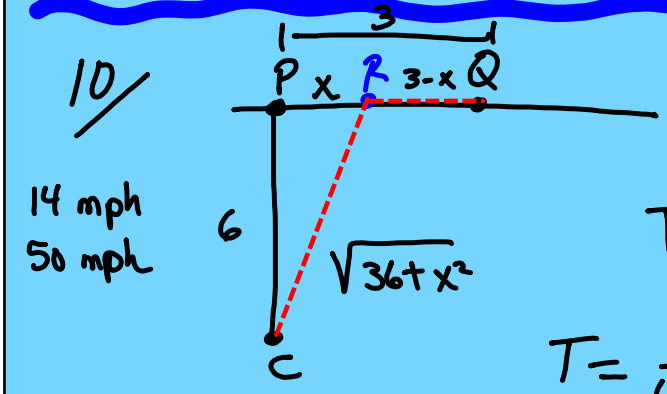
OPTIMIZATION 3

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

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

10/



14 mph
50 mph

$[0,3]$

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

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

0	0.489
7/4	0.471
3	0.479

$T' = \frac{1}{\cancel{28}\ 14}(36+x^2)^{-1/2} \cdot \cancel{2x} - \frac{1}{50}$

$0 = \frac{x}{14\sqrt{36+x^2}} - \frac{1}{50}$

1 3/4 mi from P
1 1/4 mi from Q

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

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

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

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

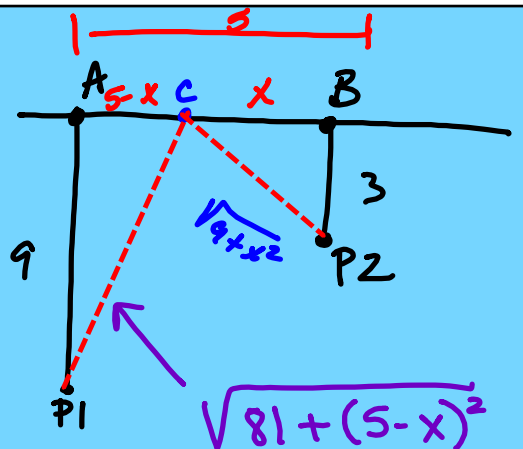
$-\frac{49x^2}{49}$

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

$\sqrt{\frac{49}{16}} = \sqrt{x^2}$

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

11)



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

$D' =$

$x =$

$[0, 5]$

0
5/4
5

$3\frac{3}{4}$ mi from A