

Maple 11 - [train.mws - [Server 1]]

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$p^2 = x^2 + 4^2$
 $r^2 = p^2 + y^2$
 $\frac{dx}{dt} \Big|_{x=5} = 500$
 $\frac{dy}{dt} \Big|_{y=1} = 80$

Want
 $\frac{dr}{dt} \Big|_{\substack{x=5 \\ y=1}}$

$r^2 = x^2 + y^2 + 16$
 $r dr = x dx + y dy$
 $\frac{dr}{dt} = \frac{x}{r} \frac{dx}{dt} + \frac{y}{r} \frac{dy}{dt}$
 $= \frac{5}{\sqrt{42}} \cdot 500 + \frac{1}{\sqrt{42}} \cdot 80$

$x=5, y=1$
 $\Rightarrow r^2 = 25 + 1 + 16$
 $= 42$

plane
 4
 5
 4
 3
 2
 1
 0
 -1
 -0.5
 y
 train
 $x=5$
 $y=1$

Available: 2.64G

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