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Team Empire

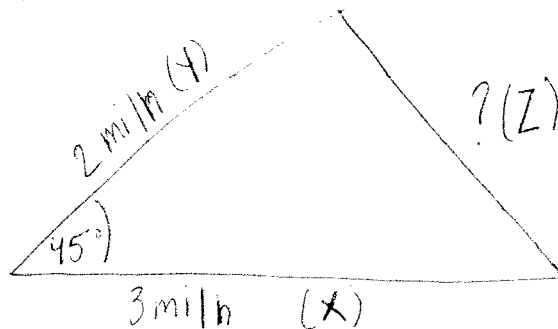
3.9 #42

$$Z^2 = x^2 + y^2 - 2xy \cos 45^\circ$$

$$Z^2 = 3^2 + 2^2 - 2(3)(2) \cos 45^\circ$$

$$Z^2 = \sqrt{6.7}$$

$$Z = \sqrt{2.58}$$



$\frac{d}{dt}$

$$2Z \frac{dZ}{dt} = 2x \frac{dx}{dt} + 2y \frac{dy}{dt} - \sqrt{2} (x \frac{dy}{dt} + y \frac{dx}{dt})$$

$$\frac{dx}{dt} = 3 \text{ mile/h}$$

$$\frac{dy}{dt} = 2 \text{ mile/h}$$

$$\frac{dZ}{dt} = 2.58 \text{ mile/h}$$

$$2Z(2.58) = 2x(3) + 2y(2) - \sqrt{2}(x(2) + y(3))$$

$$5.16Z = 6x + 4y - \sqrt{2}(2x + 3y)$$

$$.75^2 + .5^2 - 2(.5)(.75) \cos 45^\circ$$

$$2(.418) = 2(.75)(.5) + 2(.5)(.2) - \sqrt{2}(.75)(.5)$$

$$2(.418) = \frac{2.26}{.836}$$

