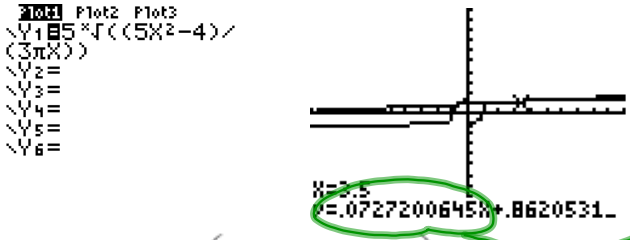
Warm Up

Determine the instantaneous rate of change for each of the following functions at the indicated time...

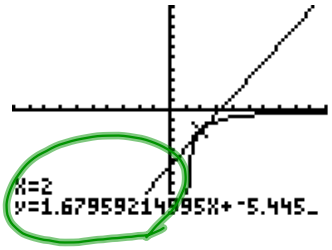
1. $H(t) = \sqrt[5]{\dfrac{5t^2 - 4}{3\pi t}}$ at $t = 3.5$



IRC=0.0727

2. $R(t) = \left(\dfrac{\ln(2t) - 5}{\sqrt{t^2 - 1}} \right)$ at $t = \dfrac{3}{8}$ sec

Does Not exist!!

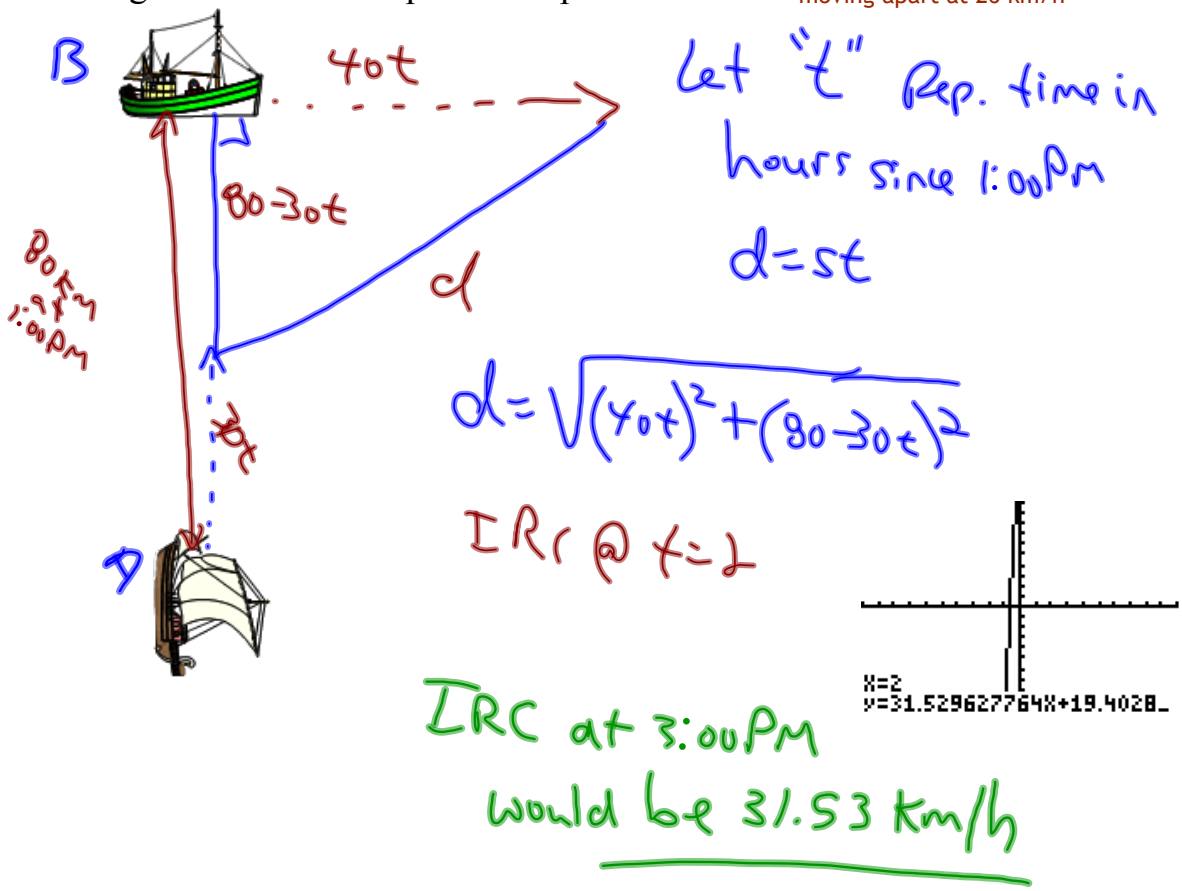


@ x=2

Example 4

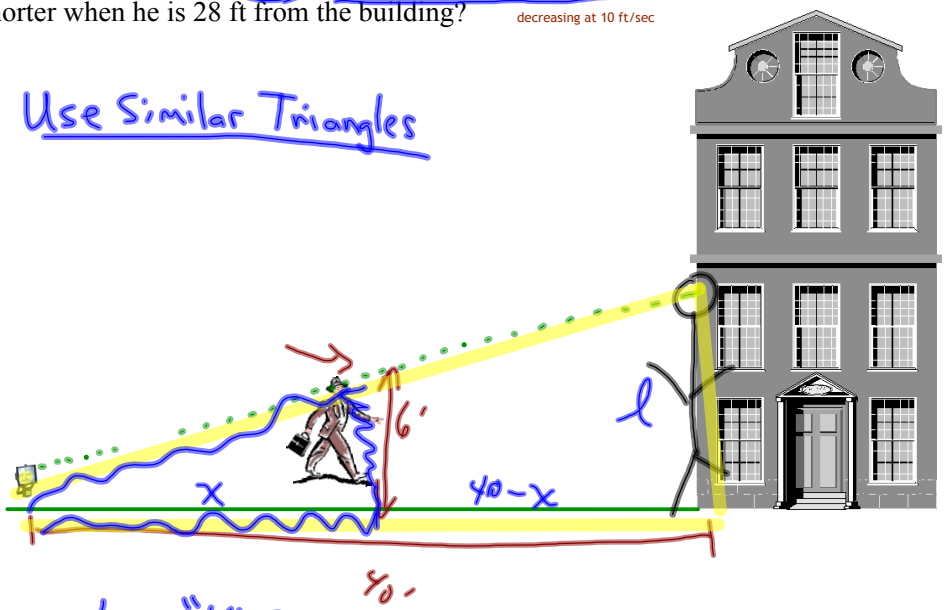
At 1:00 pm ship A was 80 km due south of ship B. Ship A is travelling north at 10 km/h and ship B is travelling east at 40 km/h. What is the instantaneous rate of change between the ships at 3:00 pm?

moving apart at 26 km/h

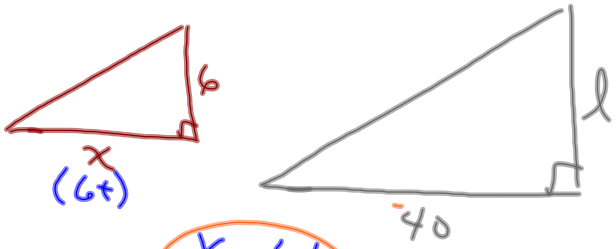


Example 5

A light is on the ground 40ft from a building. A man 6ft tall walks from the light towards the building at 6ft/s. How rapidly is his shadow on the building becoming shorter when he is 28 ft from the building? decreasing at 10 ft/sec



Let "t" Rep. time since he started to walk in seconds

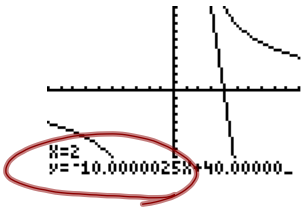


$x = 6t$

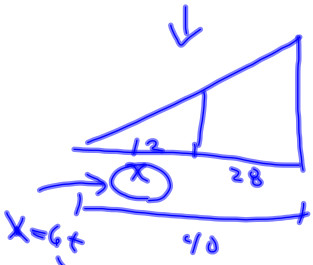
$\frac{40}{x} = \frac{\ell}{6}$

$\frac{40}{6t} = \frac{\ell}{6}$ ← Isolate for "ℓ"

$\ell = \frac{240}{6t}$ ← When do we want IRC?



Shadow is becoming shorter at 10 feet/sec



$x = 6t$

$6t = 12$

$x = 2$

Homework:

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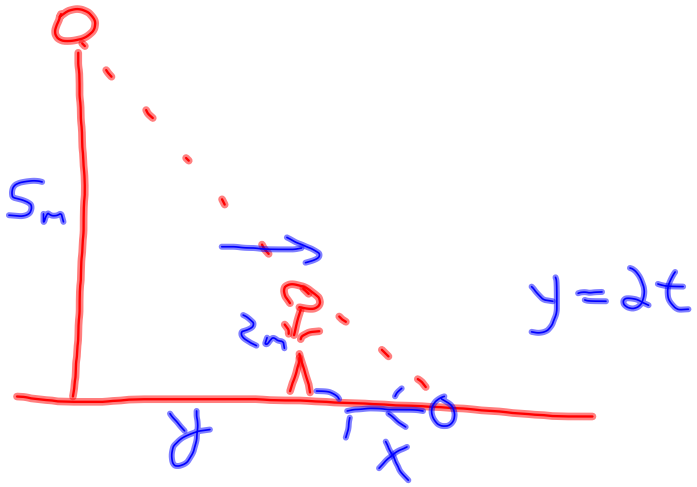
#21, 27, 28, 29, 30, 31, 32



$$\frac{5}{2} = \frac{x+y}{x}$$

$$5x = 2x + 2y$$

$$3x = 2y$$

$$x = \frac{2}{3}y$$