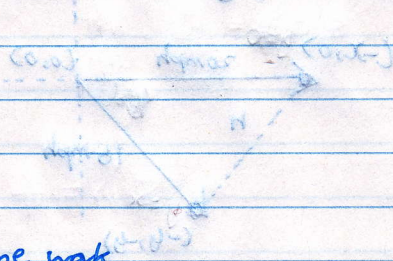


Example 1 (Swimming Pool) A boat is leaving a dock and heading out into the water. The dock is 250 ft long. The boat is moving away from the dock at a speed of 1 ft/sec. Find  $\frac{dh}{dt}$  when  $t = 250$ .

Given  $\frac{dh}{dt} = 1$  used  $h = 1$

Find  $h'(250)$  (using  $h(t)$ )

$v(t) = 250(h(t))^2$  take some work



Given so  $v'(t) = 1$  (1 ft/sec) = 1 used  $h(250) = 1$

$\frac{1}{250} = \frac{1}{250} = \frac{1}{250}$

$1 \times 250 = 250$

$D_r = (r^2 - x^2)^{1/2} = \frac{1}{2} (r^2 - x^2)^{-1/2} (2r - 2x) = \frac{r - x}{(r^2 - x^2)^{1/2}}$

Given:  $\frac{dh}{dt} = 1$  ft/sec

$\frac{1}{250} = \frac{1}{250} = \frac{1}{250}$

After 250 min, we have  $x = 10$  and  $r = 12.12$  (After 250 min  $r = 12.12$ )

$D_r = 10.12$

We got  $\frac{dh}{dt} \approx 14.1$  mph