Quiz 10

Name: SOLUTIONS

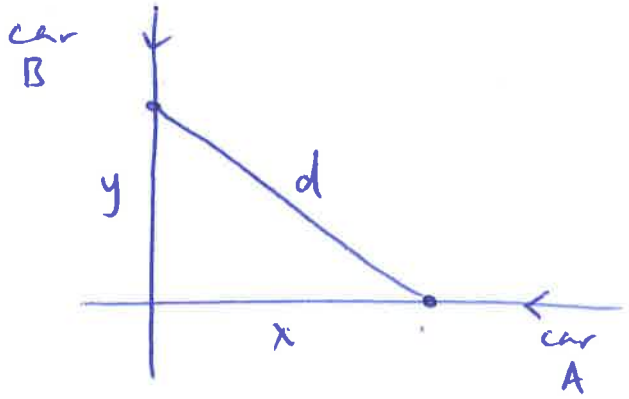
1. When a circular metal plate is heated, its radius increases by .01 cm/min. At what rate is the plate's area increasing when the radius is 50 cm?

$A = \pi r^2$, so $A' = 2\pi r r'$

$r = r_0$, $r' = .01 \Longrightarrow A' = (2\pi)(r_0)(.01) = \pi$

$$\boxed{A' = \pi \ \text{cm}^2/\text{min}}$$

2. Cars A and B are traveling along perpendicular straight-line roads; each car is moving toward the point where the roads intersect. Car A is moving at 60 mph, and car B is moving at 66 mph. At what rate is the distance between the cars changing when car A is 5 miles from the intersection point and car B is 12 miles from the intersection point?



$x^2 + y^2 = d^2$, so

$2xx' + 2yy' = 2dd'$, i.e.,

$xx' + yy' = dd'$

when $x = 5$ & $y = 12$, $d = 13$. given that $x' = -60$, $y' = -66$,

so $(5)(-60) + (12)(-66) = 13d' \Longrightarrow d' = -84$ mph