

Good afternoon: attach warmup to notebooks, then solve

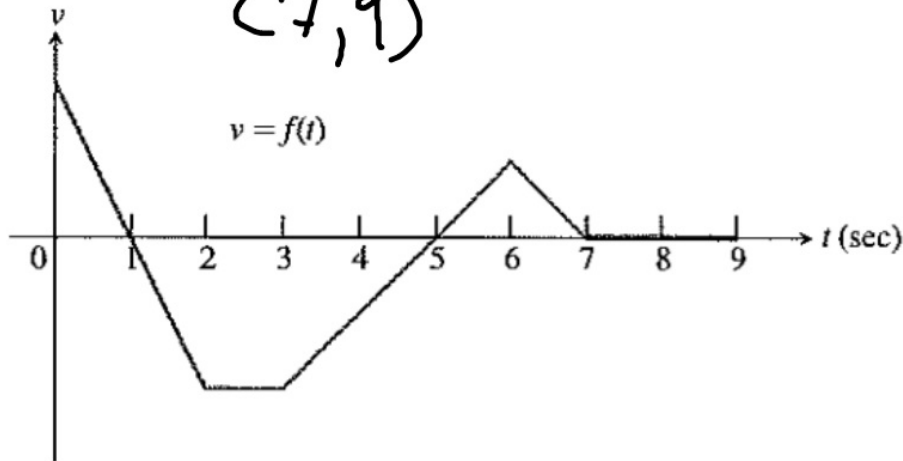
9. **Particle Motion** The accompanying figure shows the velocity $v = f(t)$ of a particle moving on a coordinate line.

(a) When does the particle move forward? move backward? speed up? slow down?

(b) When is the particle's acceleration positive? negative? zero?

(c) When does the particle move at its greatest speed? $t = 0$

(d) When does the particle stand still for more than an instant?



FWD: $(0, 1)$ $(5, 7)$

BCK: $(1, 5)$

$|f(x)|$

slow: $(0, 1)$ $(3, 5)$
 $(6, 7)$

Spd: $(5, 6)$ $(1, 2)$




reminders:

next assessment is Monday
tutoring tomorrow 4-5p
retakes available in DS

Implicit Differentiation

Explicit vs Implicit functions


$$y = 3x + 5$$

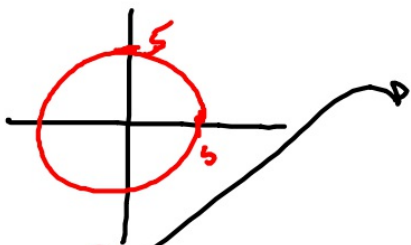
the dependent
var. is solved
for


$$-3x + y = 5$$

dep. | indep. var
are "mixed"

MY FIRST IMPLICIT DERIVATIVE

$$x^2 + y^2 = 25$$



$$y^2 = 25 - x^2$$

$$y = \pm \sqrt{25 - x^2}$$

$\sqrt{9-3}$
 $\neq \sqrt{9}-\sqrt{3}$

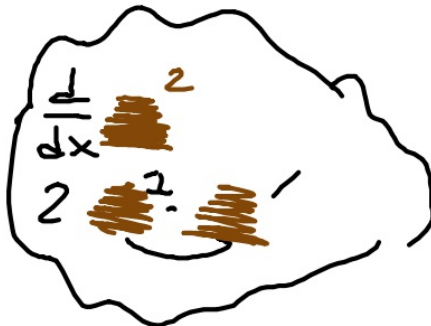
$$\frac{d}{dx} [x^2 + y^2] = \frac{d}{dx} [25]$$

① take deriv. of both sides

$$\frac{d}{dx} x^2 + \frac{d}{dx} y^2 = 0$$

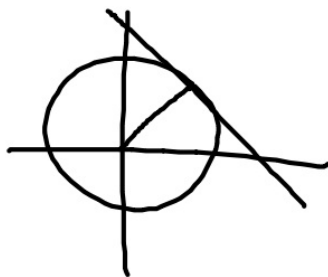
$$2x + 2y \cdot y' = 0$$

$-2x$ $-2x$



$$\frac{2yy'}{2y} = \frac{-2x}{2y}$$

$$y' = -\frac{x}{y}$$



$$x^2 + 4y^2 = 4$$

Find y' .

$$\frac{d}{dx} [x^2 + 4y^2] = \frac{d}{dx} [4]$$

$$2x + 8y \cdot y' = 0$$

$$\frac{8y \cdot y'}{8y} = \frac{-2x}{8y}$$

$$y' = \frac{-x}{4y}$$

Continue working on problems from Friday

Finished with that? Start on HW due this Friday

p. 145 #3-39 (mult of 3)

(ignore parts about graphing or solving explicitly)