

WILL IT EVER STOP HURTING?

$$\frac{d\text{Pain}}{dt} = (-k_1 \text{Pain} + \text{stick figure}) \left( \frac{1}{1 + e^{-(t-k_2)/d}} \right)$$

$k_1 = ?$     $k_2 = ?$    stick figure = How much she's still in my life

PLEASE LET  $d$  ONLY BE A FEW DAYS  
... OR WEEKS.

I GUESS THERE'S SOME KIND OF A  
CUTOFF AFTER YEARS, WHERE IT STOPS  
MATTERING AND WE CAN BE FRIENDS.  
DO I WANT THAT?

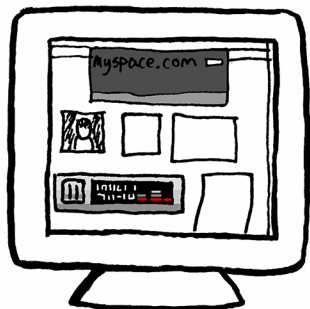
IS  $k_1$  POSITIVE? IS  $k_2$  LARGE?

WILL I EVER STOP FEELING LIKE THIS?

You laugh to keep from crying, you do math to keep from crying ...

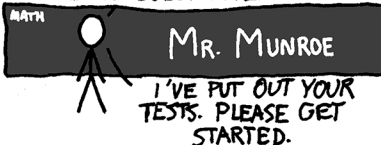


OH MAN, YOU AND EVERYONE  
IN EARSHOT ARE GONNA LOVE  
THE FIRST FIVE SECONDS  
OF THIS SONG!



It's like they got together and said 'what do we miss most from the internet in 1998? That's right, embedded MIDI!'

MISS LENHART COULDN'T BE  
HERE TODAY, SO SHE ASKED  
ME TO SUBSTITUTE.



I'VE PUT OUT YOUR  
TESTS. PLEASE GET  
STARTED.

MR. MUNROE, MISS LENHART  
NEVER TAUGHT US THIS.



THAT'S BECAUSE MISS LENHART DOESN'T  
UNDERSTAND HOW IMPORTANT CERTAIN  
KINDS OF MATH ARE.

BUT THIS JUST LOOKS --

THIS MATERIAL IS MORE VITAL THAN  
ANYTHING YOU'VE EVER LEARNED

BUT --

NO BUTS.

THIS IS A MATTER OF LIFE AND DEATH.

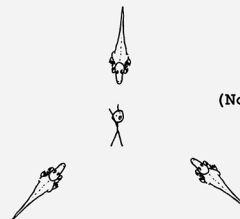
Name: \_\_\_\_\_

1. The velociraptor spots you 40 meters away and attacks, accelerating at  $4 \text{ m/s}^2$  up to its top speed of  $25 \text{ m/s}$ . When it spots you, you begin to flee, quickly reaching your top speed of  $6 \text{ m/s}$ . How far can you get before you're caught and devoured?



2. You are at the center of a  $20\text{m}$  equilateral triangle with a raptor at each corner. The top raptor has a wounded leg and is limited to a top speed of  $10 \text{ m/s}$ .

(Not to scale)



The raptors will run toward you. At what angle should you run to maximize the time you stay alive?

3. Raptors can open doors, but they are slowed by them. Using the floor plan on the next page, plot a route through the building, assuming raptors take 5 minutes to open the first door and halve the time for each subsequent door. Remember, raptors run at  $10 \text{ m/s}$  and they do not know fear.

YOU THINK THIS IS FUNNY?