

MA 507

Chapter 2 Section 6

Opener

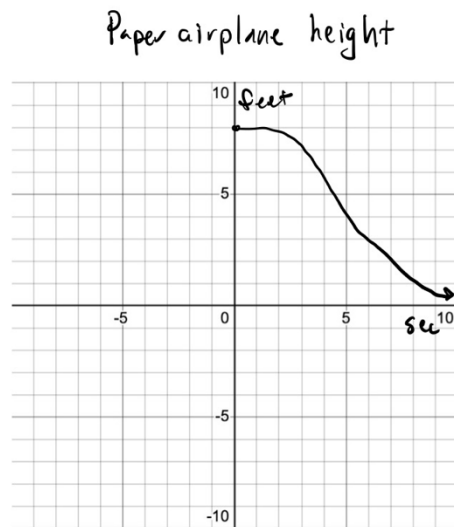
Calculate these limits:

A. $\lim_{x \rightarrow 1} \frac{x^2 - 5x + 4}{x - 1}$

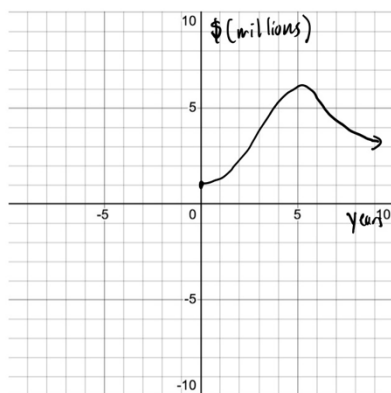
B. $\lim_{x \rightarrow 2} \frac{\sqrt{x+7}-3}{x-2}$ (hint: use the conjugate)

C. $\lim_{h \rightarrow 0} \frac{(2+h)^2 - 4}{h}$

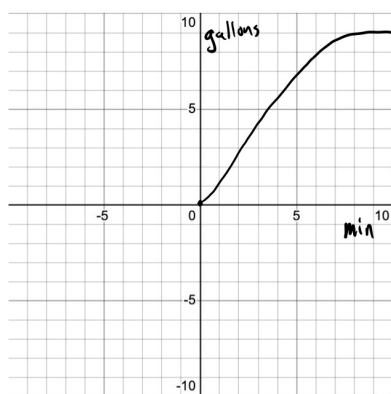
In each of the graphs below write the units for slope:



Profit over time



Filling a container



Instantaneous Rates of Change

The instantaneous rate of change of a function is measured by the _____. The _____ is computed by doing a _____. There are 2 versions of this _____.

a.

b.

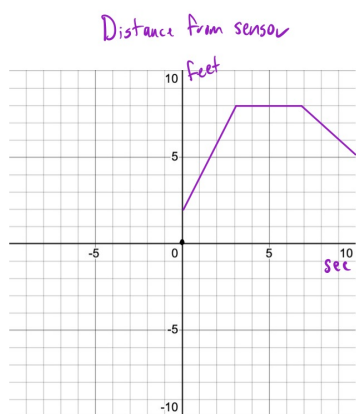
Find the slope of $f(x) = x^2 - 2x$ at $x = 2$ using both definitions:

a.

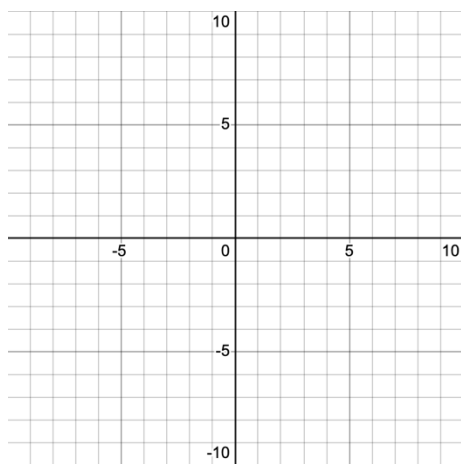
b.

DESMOS BREAK

A motion sensor is tracking the position of person in terms of distance from the sensor. Use the graph below to describe the motion of the individual in words. Be sure to include descriptions of the velocity of the individual.

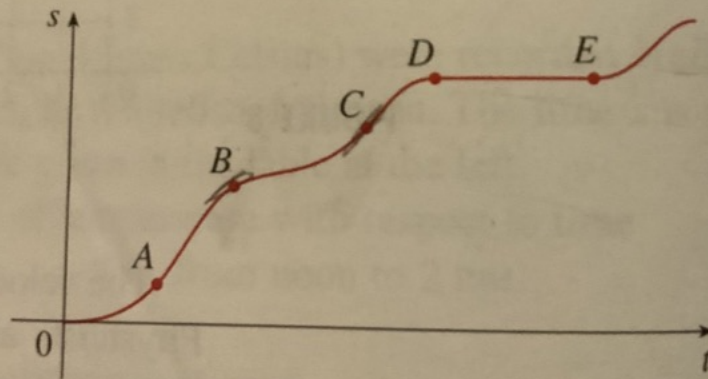


Draw a graph of the velocity function



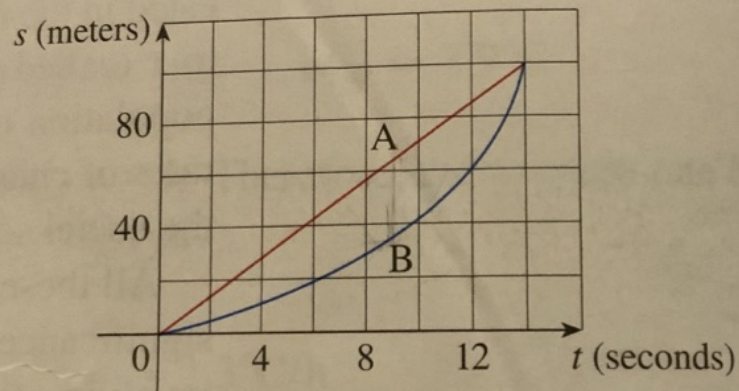
15. The graph shows the position function of a car. Use the shape of the graph to explain your answers to the following questions.

- What was the initial velocity of the car?
- Was the car going faster at B or at C ?
- Was the car slowing down or speeding up at A , B , and C ?
- What happened between D and E ?



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16. Shown are graphs of the position functions of two runners, A and B, who run a 100-m race and finish in a tie.



- (a) Describe and compare how the runners run the race.
- (b) At what time is the distance between the runners the greatest?
- (c) At what time do they have the same velocity?

- a.
- b.
- c.

Calculate the tangent line to the function $f(x) = x^2 - 3x + 5$ at $x = 3$. What version of the equation of a line will you use (slope intercept/standard/point-slope)?