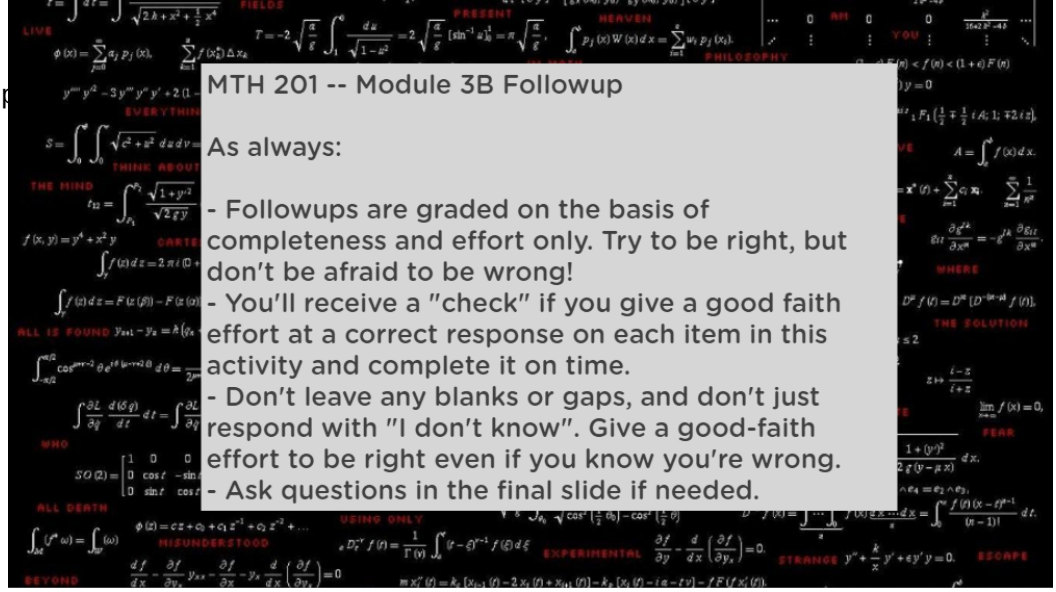


MTH 201 -- Module 3B Followup

As always:

- Followups are graded on the basis of completeness and effort only. Try to be right, but don't be afraid to be wrong!
- You'll receive a "check" if you give a good faith effort at a correct response on each item in this activity and complete it on time.
- Don't leave any blanks or gaps, and don't just respond with "I don't know". Give a good-faith effort to be right even if you know you're wrong.
- Ask questions in the final slide if needed.

Below, draw the graphs of functions that are:

(a) Increasing and concave up for all x
(b) Decreasing and concave up for all x
(c) Increasing and concave down for all x
(d) Decreasing and concave down for all x.

So you are drawing four different functions here -- not one function that has all four of these characteristics.

Increasing and concave up for all x:

Decreasing and concave up for all x

Increasing and concave down for all x

Decreasing and concave down for all x

Sketch the graph of a function y = f(x) that has the following properties:

* The domain of f(x) is the entire set of real numbers.
* f(x) is positive for all x.
* f′(x) -- the derivative -- is positive when x < 2 and negative when x > 2.
* f″(x) -- the second derivative -- is positive when x < 5 and negative when x > 5.

Add some text or audio that explains why your graph fits all of the description above.

It's probably best to try this on paper first, then sketch or upload a photo here when you're sure you have a correct graph.

Let's bring this discussion back to positions and velocity. We learned in Module 1 that velocity is the instantaneous rate of change in position. When we look at the rate of change in velocity, this is called acceleration.

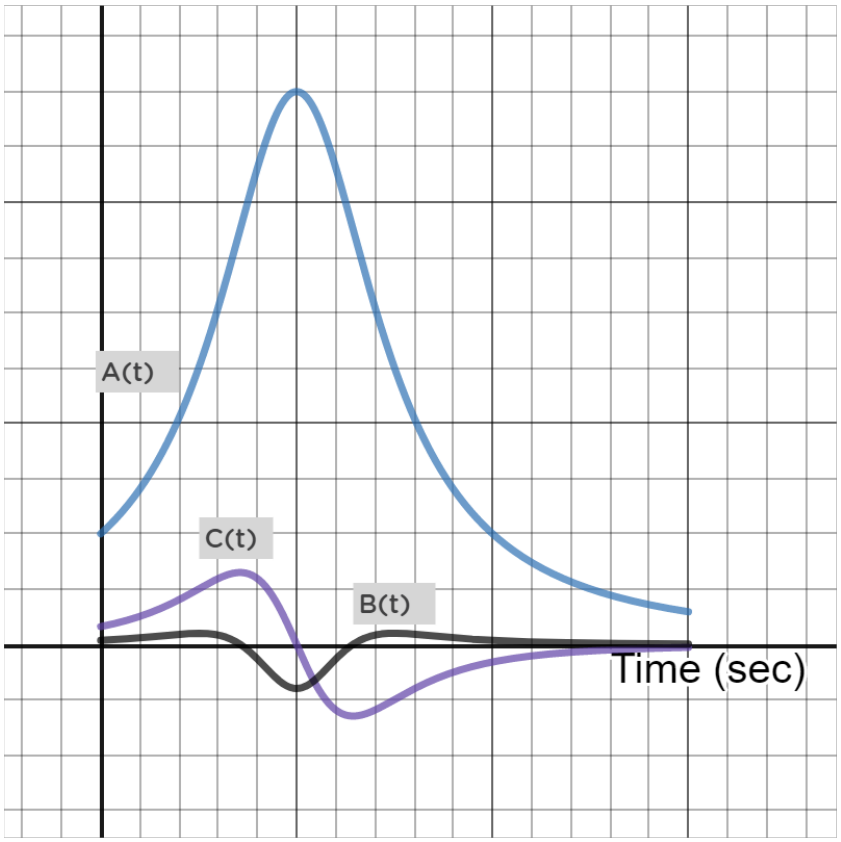
Suppose that s(t) is a function that gives the position of a moving car. Let v(t) be its velocity. Because velocity is the rate of change in position, we now can say that v(t) is the derivative of s(t). That is, $v(t) = s'(t)$.

1. Let's say the acceleration of the car is named a(t). How would you compute a(t) if you knew v(t)?

2. How would you compute a(t) if you knew s(t)?

A test lab at a car manufacturing facility is measuring the position, velocity, and acceleration of a prototype car as it is being driven. All three of these quantities are functions of time. The lab technician used the data to make graphs of each of them, but unfortunately forgot to label which one was which. They are shown below with the labels A(t), B(t), and C(t). Which one is the position function, which is the velocity, and which is the acceleration?

Clearly indicate which is which and explain your reasoning.



Use this space to give me any questions, comments, or feedback that you have on this module so far.