Chapter 2 – Section 2.6 Concavity

TICKET-IN-THE-DOOR

In order to be prepared for class you must watch the module and complete the following activity. This is due first thing when you get to class.

Check your understanding:
1. A model rocket is launched from the roof of a building. For height h, in meters, and time t, in seconds, after the rocket is launched, the height of the rocket above the ground is given by $h = f(t) = -4.9t^2 + 40t + 16$. Is the graph of $f(t)$ concave up or concave down? Explain why.

2. Calculate **successive rates of change** for the function $g(t)$ shown in the following table to determine if the graph is more likely concave up or concave down for $0 \le t \le 3$.

t	0	1	2	3
$g(t)$	0	5	9	12

3. Does the graph of $= 4x^2 - 4x$ appear to be concave up, concave down, or neither? Explain why.

4. Determine the concavity of the graph of $f(x) = x^2 - x - 9$ between $x = -1$ and $x = 2$ by calculating **average rates of change** over intervals of length 1. Is the graph concave up or concave down?

5. When a rumor begins, the number of people who have heard the rumor increases slowly at first. As the rumor spreads, the rate of change increases (as more people continue to tell their friends the rumor), and then slows down again (once almost everyone has heard the rumor). Sketch a graph to represent this situation, what can you say about the concavity?

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