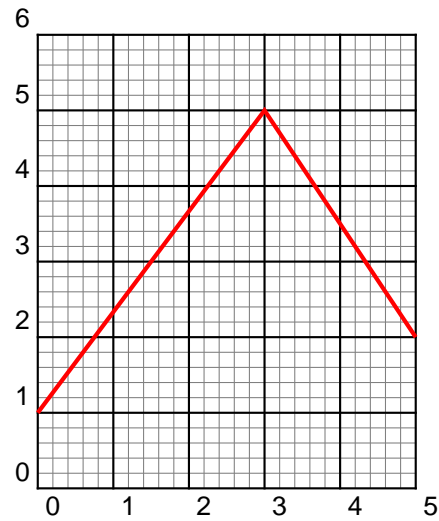
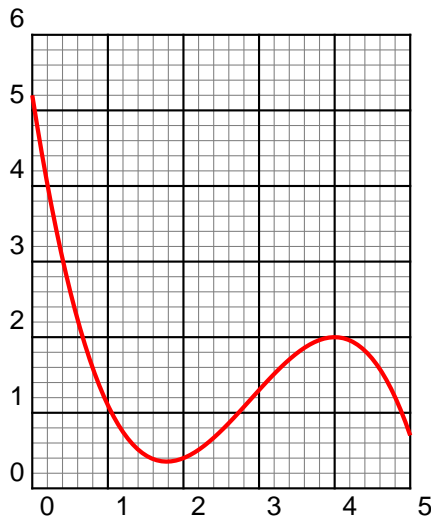


Name: _____

Please show all work. Supply brief narration with your solutions and draw conclusions.

1. Justin Bieber starts a bacterial culture in a petri dish. Three days later the colony is 8 million strong. Four more days pass and the colony is now at 12 million. How many bacteria will Justin have after two more days?
2. DNA is replicating in a petri dish. The amount of DNA is doubling every minute. The initial amount of DNA in the dish is 6 nanograms. The amount of DNA y in nanograms (ng) at time t (in minutes) is given by the following formula: $y = 6 \cdot 2^t$.
 - (a) By evaluating the function $y(t)$ at $t = 5$ and points nearby, provide a numerical estimate for the instantaneous rate of change $y'(5)$.
 - (b) Explain the meaning of your answer in part (a) using a complete sentence and including units.
3. Graphically differentiate the following functions. You may use the same grids, but keep in mind that you may need to draw outside the grid as well.



1	2	3	total (30)