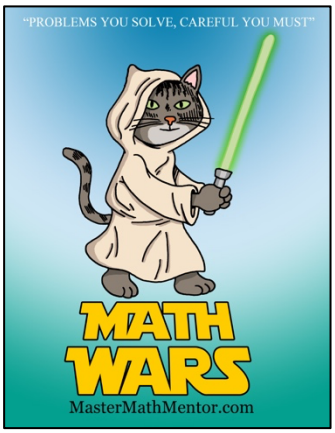
Math Wars – SAT/ACT
Topic 513 – Linear/Exponential Growth



Maximum Time: 8 Minutes

Directions: To start, you need to download the Math Wars application on your cell phone: Use the QR code or the url: https://mastermathmentor.com/mmm/mathwars.ashx?key=513

When ready, start the timer and then solve the problems below, entering your choice, A, B, C, D and pressing Submit for each problem when you are sure of your answer. When complete, stop the timer. You will see problems you got correct in green and incorrect in red. You will receive a score based on how many problems you got right and your time. A perfect score is all problems correct using half the maximum time or less. You can text or email your friends with your results.

1. (1 pt) Given the ordered pairs (–5, –9), (–4, –6), and (–2, 0), which of the following describes the relationship between them.

A. linear growth B. linear decay C. exponential growth D. exponential decay

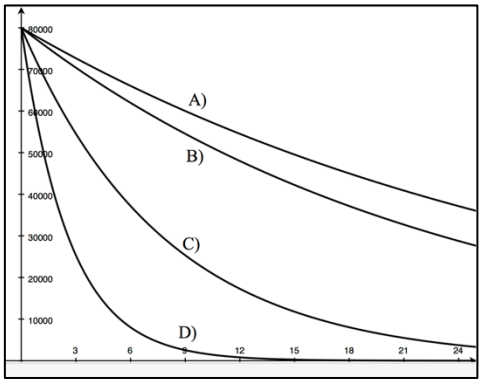
2. (3 pts) A radioactive metal loses 28% of its mass quarterly. If it has a mass of 90 grams initially, which of the following inequalities has its solution for t representing the time in years when its mass is less than 50 grams.

A. $90(0.28)^{t/4} < 50$ B. $90(0.72)^{t/4} < 50$ C. $90(0.28)^{4t} < 50$ D. $90(0.72)^{4t} < 50$

3. (5 pts) A drain is emptying a hot tub. After 10 minutes has 1,000 gallons of water and after 30 minutes, it has 600 gallons. If the water drains at a constant rate, which of the following represents the additional time it takes to empty the hot tub?

A. 60 minutes B. 45 minutes C. 30 minutes D. 15 minutes

4. (7 pts) A lake has approximately 80,000 fish. Due to climate change, its temperature is rising and fish die off. It is estimated that the lake will lose 16% of its fish population every 4 months. Which of the following graphs represents the fish population over a period of 36 months?



5. (9 pts) Two towns, each with population 3,500 are gaining 3% of their populations a year. Town A gains people in a linear fashion while town B gains people in an exponential fashion. Assuming no one moves into the towns, what is the approximate difference in their populations after 7 years?

A) 91 B) 82 C) 70 D) 49