HW L4-6

Name _____

🔢1.

The function W models the total amount of waste stored at a landfill. Let $W(t) = 250 + 1200e^{\frac{t}{24}}$, where $W(t)$ is the number of tons of waste, t years after 2012 .

a. How many tons of waste are at the landfill in 2012 ?

b. How many tons of waste are at the landfill in 2018 ? Round to three decimal points.

🔢2.

A sum of $\$850$ is placed in an account earning 1.7% interest, compounded continuously. How much will be in the account after 10 years?

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3. A piece of bread left on a counter grows mold according to a continuous exponential growth model at a rate of 4.3% each hour. Initially there are 3 grams of mold present.

a. Write an equation for $M(t)$, the number of grams of mold on the piece of bread after t hours.

b. How many grams of mold will be on the bread after 1 day (24 hours)? Round to three decimal places.

▦4.   Money is invested into an account earning 8% interest.

        a. If interest is compounded quarterly, how many interest payments are earned over 5 years?

        b. If interest is compounded quarterly, by what factor does the amount in the account grow each time an interest payment is earned?

        c. If interest is compounded monthly, how many interest payments are earned over 5 years?

        d. If interest is compounded monthly, by what factor does the amount in the account grow each time an interest payment is earned?

▦5.   An account contains $\$10000$. If the interest rate is 3% , how much greater is the amount in the account after 5 years if the interest is compounded continuously compared to if the interest is compounded monthly?

▦6. Atmospheric pressure decreases continuously at a rate of approximately 12% per kilometer as the elevation increases. If the pressure at sea level, measured in hectopascals, hPa, is 1013.25 hPa, what is the pressure at 5.2 kilometers above sea level? Round to the nearest hundredth.
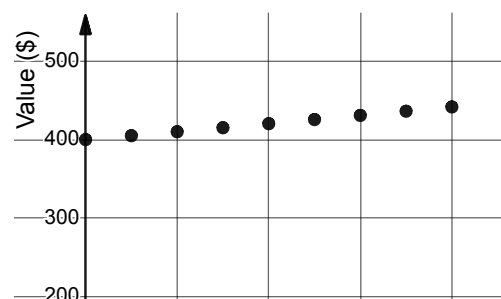
▦7. Which of the following scenarios would best be modeled by a continuous exponential growth or decay model?
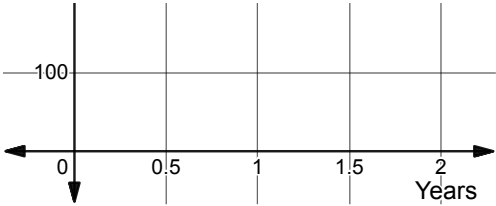
A) The number of rabbits in an Australian meadow

B) The number of people who hear a rumor at a school

C) The temperature of a mug of hot chocolate as it cools
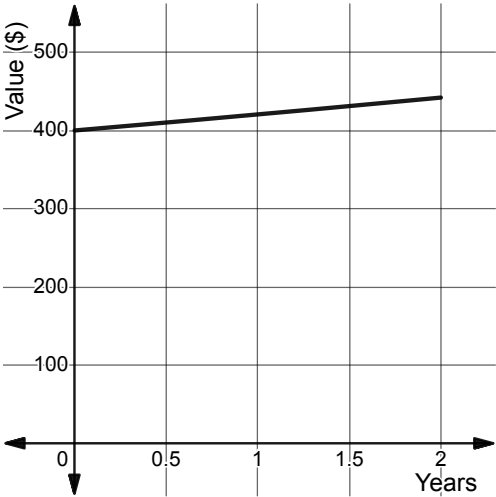
D) The height of a basketball after each bounce

▦8. The three graphs below represent the value of a $\$400$ investment earning 5% interest over the course of 2 years. Determine if the scenario represented by each graph represents interest compounded annually, biannually, quarterly, monthly, or continuously. Explain how you know.

a.

b.

c.