Name_____

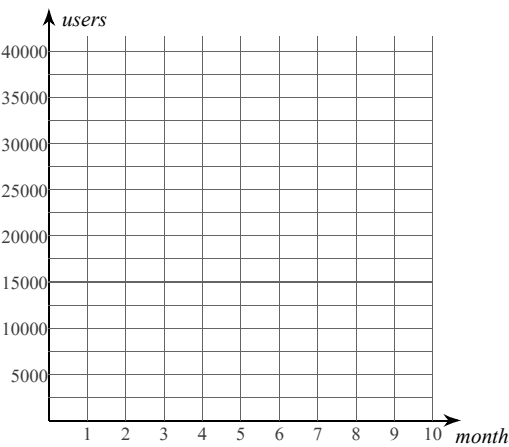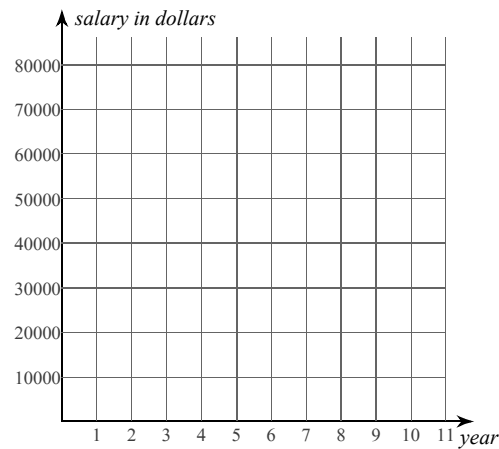# Discrete Exponential Growth and Decay
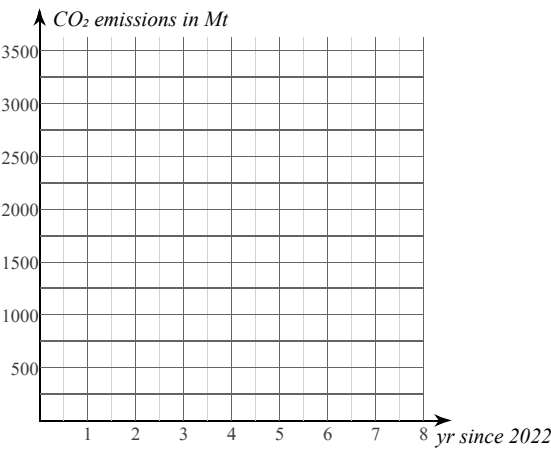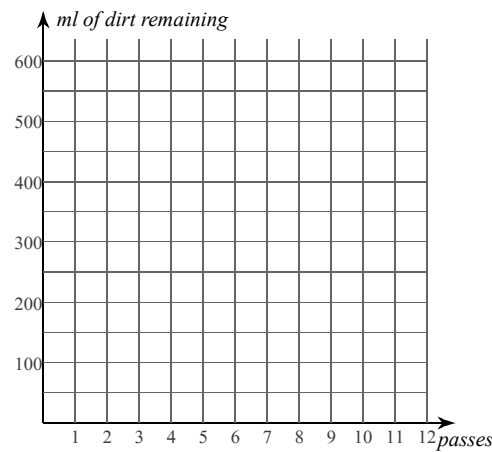
Date_____ Period_____

Solve each discrete exponential growth/decay problem. You may use the provided graph to plot points or sketch the exponential function.

1) An employee receives a 2% raise once per year. If the employee's initial salary is $60,000.00, what will the employee's salary be after 9 years?

salary in dollars

80000

70000

60000

50000

40000

30000

20000

10000

1 2 3 4 5 6 7 8 9 10 11 *year*

2) A new social media site is increasing its user base by approximately 6% per month. If the site currently has 21,740 users, what will the approximate user base be 8 months from now?
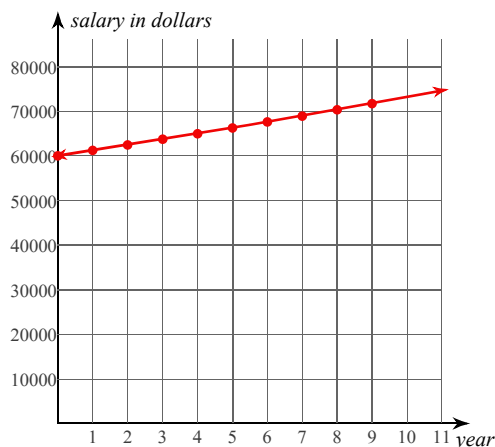
users

40000

35000

30000

25000

20000

15000

10000

5000

1 2 3 4 5 6 7 8 9 10 *month*

3) A robot vacuum cleans a dirty floor using multiple passes. During each pass, 22% of the dirt is removed. If the floor initially has 530.0 ml of dirt, how much dirt will remain after 10 passes?

ml of dirt remaining

600

500

400

300

200

100

1 2 3 4 5 6 7 8 9 10 11 12 *passes*

4) A country pledges to reduce its annual CO_2 emissions by 3% per year. If the emissions in 2022 are 3,030 Mt (metric megatons), what are the maximum allowable emissions in the year 2028?

CO_2 emissions in Mt

3500

3000

2500

2000

1500

1000

500

1 2 3 4 5 6 7 8 *yr since 2022*

Name_____

# Discrete Exponential Growth and Decay

Date_____ Period_____

Solve each discrete exponential growth/decay problem. You may use the provided graph to plot points or sketch the exponential function.

1) An employee receives a 2% raise once per year. If the employee's initial salary is $60,000.00, what will the employee's salary be after 9 years?


salary in dollars

$$60000 \cdot 1.02^9 \approx \$71{,}705.55$$

2) A new social media site is increasing its user base by approximately 6% per month. If the site currently has 21,740 users, what will the approximate user base be 8 months from now?
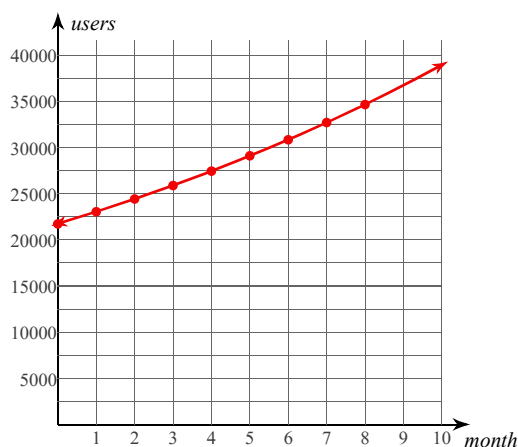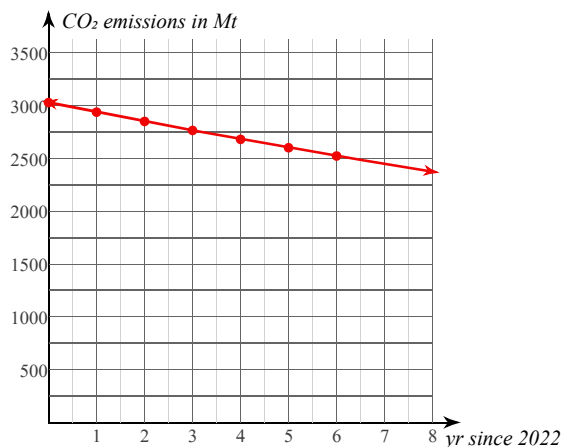

users

$$21740 \cdot 1.06^8 \approx 34{,}650 \text{ users}$$

3) A robot vacuum cleans a dirty floor using multiple passes. During each pass, 22% of the dirt is removed. If the floor initially has 530.0 ml of dirt, how much dirt will remain after 10 passes?

ml of dirt remaining
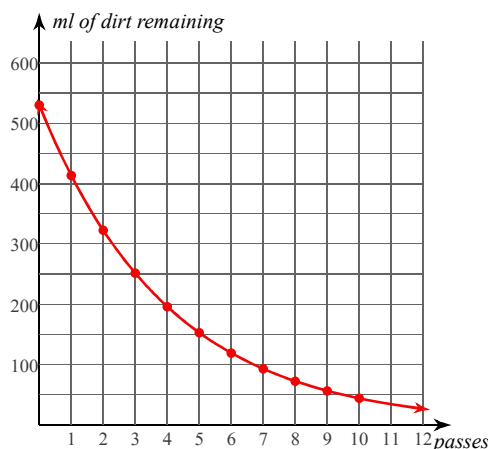
$$530 \cdot 0.78^{10} \approx 44.2 \text{ ml}$$

4) A country pledges to reduce its annual CO_2 emissions by 3% per year. If the emissions in 2022 are 3,030 Mt (metric megatons), what are the maximum allowable emissions in the year 2028?

CO_2 emissions in Mt

$$3030 \cdot 0.97^6 \approx 2{,}524 \text{ Mt}$$