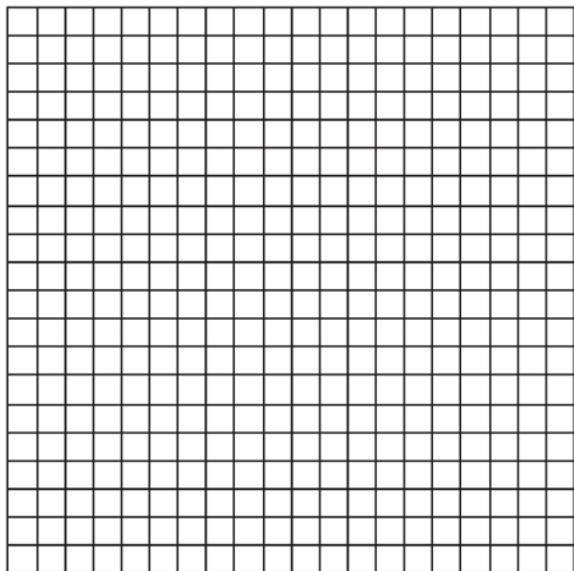
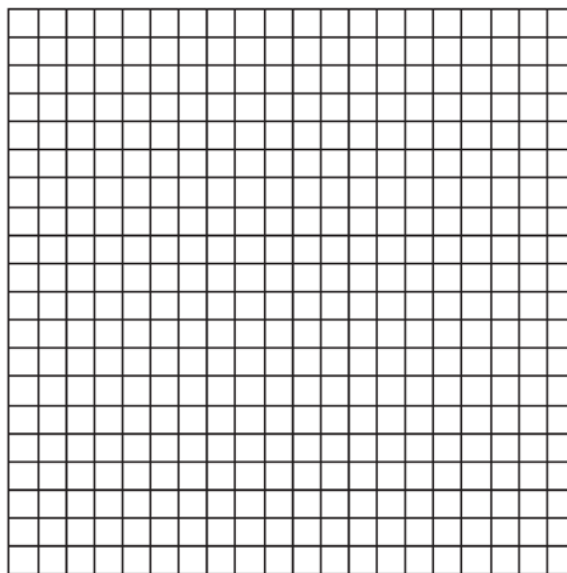


A2.A.6: Exponential Growth 2: Solve an application which results in an exponential function

- 1 Since January 1980, the population of the city of Brownville has grown according to the mathematical model $y = 720,500(1.022)^x$, where x is the number of years since January 1980. Explain what the numbers 720,500 and 1.022 represent in this model. If this trend continues, use this model to predict the year during which the population of Brownville will reach 1,548,800. [The use of the grid is optional.]

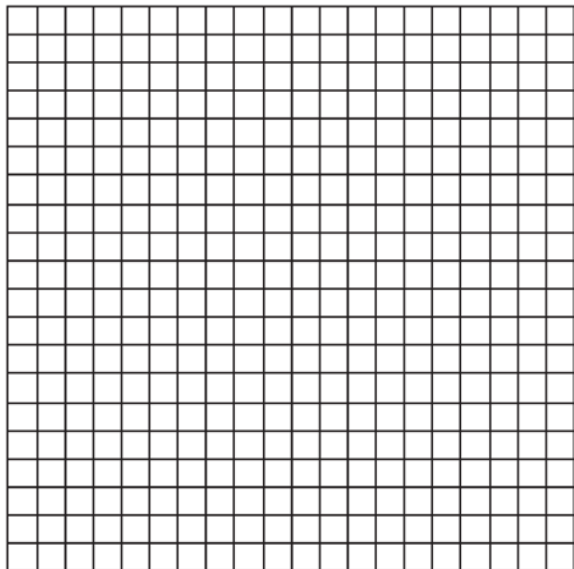


- 2 After an oven is turned on, its temperature, T , is represented by the equation $T = 400 - 350(3.2)^{-0.1m}$, where m represents the number of minutes after the oven is turned on and T represents the temperature of the oven, in degrees Fahrenheit. How many minutes does it take for the oven's temperature to reach 300°F ? Round your answer to the *nearest minute*. [The use of the grid is optional.]



- 3 Kristen invests \$5,000 in a bank. The bank pays 6% interest compounded monthly. To the nearest tenth of a year, how long must she leave the money in the bank for it to double? (Use the formula

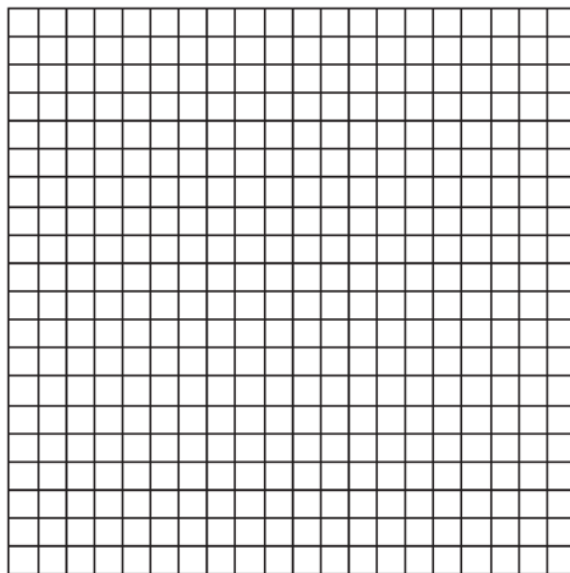
$A = P\left(1 + \frac{r}{n}\right)^{nt}$, where A is the amount accrued, P is the principal, r is the interest rate, $n = 12$, and t is the length of time, in years.) [The use of the grid is optional.]



- 4 An amount of P dollars is deposited in an account paying an annual interest rate r (as a decimal) compounded n times per year. After t years, the amount of money in the account, in dollars, is

given by the equation $A = P\left(1 + \frac{r}{n}\right)^{nt}$. Rachel

deposited \$1,000 at 2.8% annual interest, compounded monthly. In how many years, to the nearest tenth of a year, will she have \$2,500 in the account? [The use of the grid is optional.]



A2.A.6: Exponential Growth 2: Solve an application which results in an exponential function
Answer Section

1 ANS:

720,500 is the population in 1980, 1.022 represents a growth rate of 2.2% added to the current population, 2015

PTS: 4

REF: 010728b

2 ANS:

11

PTS: 4

REF: 080632b

3 ANS:

11.6

PTS: 4

REF: 080832b

4 ANS:

32.8

PTS: 4

REF: 080428b