

Not written with function shown growth or decay.

12. Give $g(x)$ $y = 400 + 0.02(1.02)^x$ $y = 400 + 0.02e^{0.02x}$ $y = 400 + 0.02e^{0.02x}$
 decay growth decay growth

13. The rate of depreciation on a new dollar car is 20% yearly. Writing a new function for the value of the car after x years. What will the car be worth in 4 years?

$$y = 400(0.8)^x$$

$$y = 400(0.8)^4 = 209.7152$$

14. During exponentially good times, the value of a house grows by 10% yearly. If I purchase a house for \$250,000, or \$1, an equation that shows the value of my house after x years. What will my house be worth after 4 years? Assuming with rate for my house to grow 1.1 raised

$$y = 250,000(1.1)^x$$

$$y = 250,000(1.1)^4 = 370,530.625$$

15. The amount of freight transportation by rail in the United States was about 100 billion ton-miles in 2000 and has been growing at a rate of 2.2% per year since then. Write a function representing the amount of freight, in billion ton-miles, transported annually (2000 = year 0). What year will the amount of freight reach 1 trillion (1000 billion)?

$$y = 100(1.022)^x$$

$$1000 = 100(1.022)^x$$

$$10 = 1.022^x$$

$$\ln 10 = x \ln 1.022$$

$$x = \frac{\ln 10}{\ln 1.022} \approx 167.7$$

16. A quantity of money will be deposited into the bank every month by about 1% each month. A bank might estimate how a generally 10 months. Write a function to represent the amount of the dollar that monthly bank deposits will reach after 10 months?

$$y = 10(1.01)^x$$

17. In 2008, the Davis family deposited \$100,000 in a bank. Suppose that, instead, \$25 had been invested in a account that grew 10% interest each year. Write a function to represent the value of the investment. What the interest in 2008.

$$y = 25(1.1)^x$$

$$y = \frac{1000}{1.1^{10}} = 681.26$$