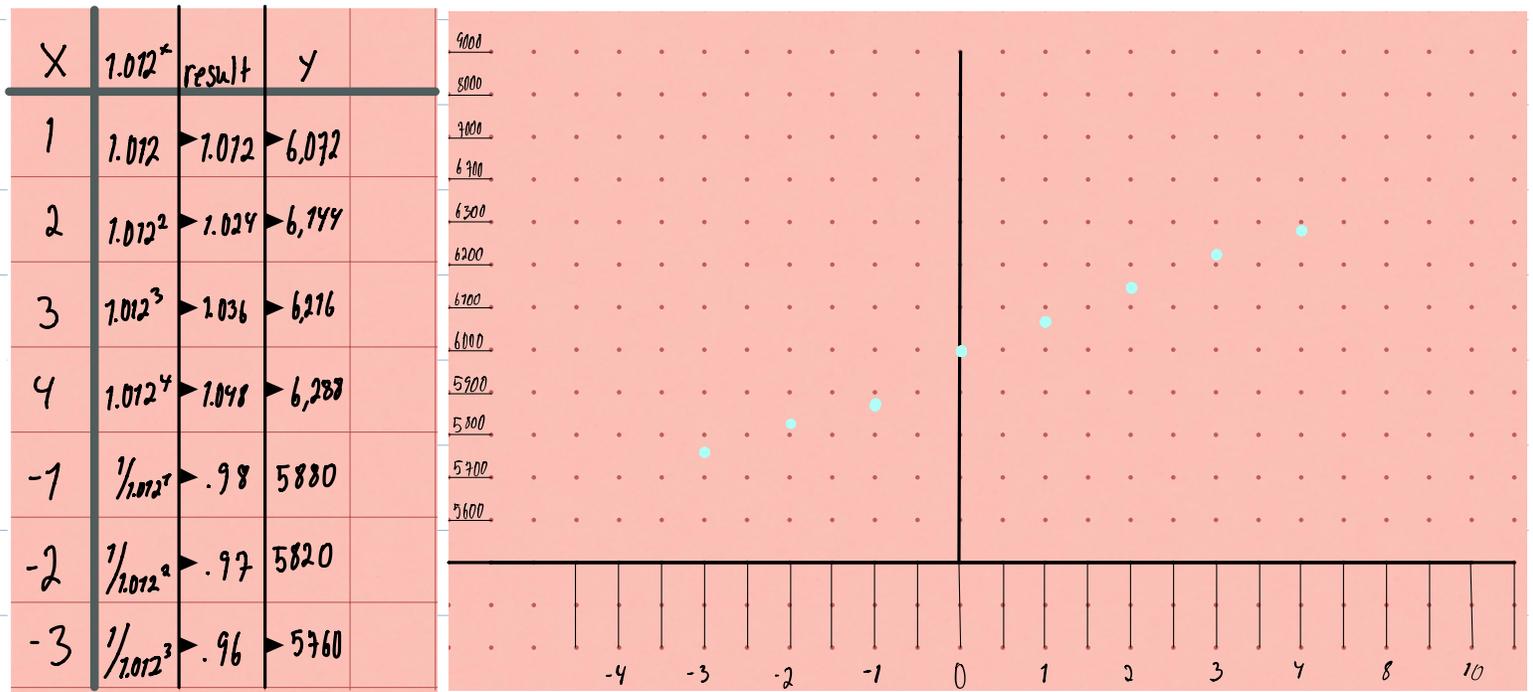


2

A population is currently 6,000 and has been increasing by 1.2% each day. Write an exponential model for the population.



$$f(x) = a(1+r)^x$$

$$f(x) = 6000(1+0.012)^x$$

$$6000 \cdot (1.012)^x$$

4. A business purchases \$125,000 of office furniture which depreciates at a constant rate of 12% each year. Find the residual value of the furniture 6 years after purchase.

$$f(x) = a(1+r)^x$$

$$f(x) = 125,000(1-.12)^x$$

$$125,000 \cdot (.88)^x$$

$$f(6) = 125,000 \cdot (.88)^6$$

$$= 125,000 \cdot .4644$$

$$= 58,050.51$$

The furniture depreciates to \$58,050.51 after 6 years.

6. If \$6,000 is invested in a bank account at an interest rate of 9 percent per year, find the amount in the bank after 5 years if interest is **compounded** annually, quarterly, monthly, and continuously.

$$\text{Annual interest rate} = 9\%$$

$$6000(1+.0225)^7$$

$$\text{Quarterly interest rate} = 2.25\%$$

$$\text{Monthly interest rate} = .75\%$$

$f(x) = \text{principal} (1 + r/n) \cdot \underline{nt} = \text{full formula}$

$$6000 (1 + .09/1)^{1 \cdot 5}$$

$$6000 (1 + .09)^{1 \cdot 5}$$

$$6000 (1.09)^5$$

$$6000 (1.5386)$$

$$9,231.6$$

Quarterly

$$6000 (1 + .09/4)^{4(5)}$$

$$6000 (1 + .0225)^{20}$$

$$6000 (1.0225)^{20}$$

$$6000 (1.56051)$$

$$9,363.05$$

Monthly

$$6000 (1 + .09/12)^{12(5)}$$

$$6000 (1 + .0075)^{60}$$

$$6000 (1.0075)^{60}$$

$$6,967.70$$

Continuously

$$a = 6000 \cdot e^{(.09 \cdot 5)}$$

$$9,409.87$$

8. F

10. D

12. C

14. C

16. F