

**Practice- Write either a linear or exponential model for the situation in order to answer the question:**

1. A library has 8000 books, and is adding 500 more books each year. How many books will it have in 12 years?

$$y = 500x + 8000$$

$$y = 500(12) + 8000$$

$$y = \$14,000$$

2. Enrollment at a school is initially 454 students and grows by 3% per year. How many students will it have in 10 years?

$$y = 454(1 + .03)^t$$

$$y = 454(1 + .03)^{10}$$

$$y = 610.14 \quad \boxed{\text{about } 610}$$

3. A wildlife park has 35 zebras and sends 2 zebras to another wildlife park each year. In how many years will 15 zebras remain?

$$y = -2x + 35$$

$$15 = -2x + 35$$

$$-20 = -2x$$

$$x = 10 \text{ years}$$

4. A salesperson initially earns \$50,434 dollars per year and receives a yearly raise of \$675. After how many years will his salary surpass \$60,000?

$$y = 675x + 50,434$$

$$60,000 = 675x + 50,434$$

$$x = 14.17$$

After 15 years

5. The value of a house is \$546,768 and decreases by 3% each year. What will be the value of the house after 5 years?

$$y = 546,768(1 - .03)^t$$

$$y = 546,768(1 - .03)^5$$

$$y = \$469,528.29$$

6. A customer borrows \$450 at 5% annual interest. How much will she owe in 3 years?

$$y = 450(1 + .05)^t$$

$$y = 450(1 + .05)^3$$

$$y = \$520.93$$

7. Lilly and Emily each initially earn \$18.00 per hour. If Lilly receives a \$1.50 per hour raise each year and Emily receives a 4% raise each year, when will Emily make more per hour than Lilly?

$$y = .75x + 18$$

x	1	2	3	4
y	18.75	19.5	20.25	21

$$y = 18(1.04)^x$$

x	1	2	3	4	5	6	7	8
y	18.72	19.47	20.25	21.06	21.9	22.79	23.69	24.63