



# PRACTICE / HOMEWORK

Use the scenario below to complete questions 1 – 5.

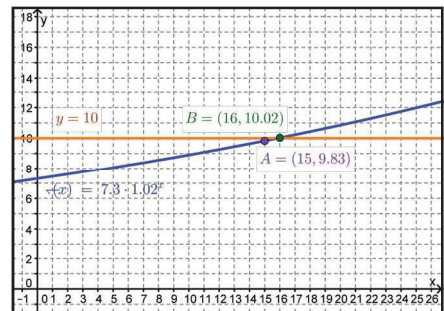


## DEMOGRAPHY

The world population,  $f(x)$ , is growing at a rate of 2% per year. In 2015, the world population was 7.3 billion. The function below represents this situation if  $x$  represents the number of years since 2015.

$$f(x) = 7.3(1.02)^x$$

- Write an equation that can be used to determine when the world's population will reach 10 billion.
- The graph represents  $f(x)$ , the world population, and  $y = 10$ . What do the points  $A$  and  $B$  represent on the graph?
- When will the world population be at exactly 10 billion?



The table shows the world population,  $f(x)$ , based on the numbers of years since 2015.

- When will the world population reach 7.8 billion?
- Using the table in problem 4, when will the world population reach exactly 8 billion?

NUMBER OF YEARS SINCE 2015 $x$	WORLD POPULATION (BILLIONS) $f(x)$
0	7.3
1	7.446
2	7.595
3	7.747
4	7.902
5	8.060

Use the scenario below to complete questions 6 – 10.

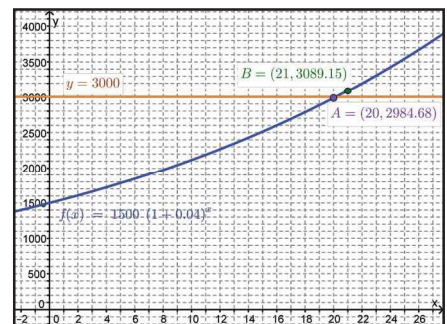


## FINANCE

Jake invests \$1500 into an account that pays 3.5% interest compounded annually. The function  $f(x)$  represents the balance in his account after  $x$  years.

$$f(x) = 1500(1 + 0.035)^x$$

- Write an equation that can be used to determine when Jake's money will double.
- The graph represents  $f(x)$  and  $y = 3000$ . What do the points  $A$  and  $B$  represent in the situation?



8. When will Jake's account balance reach exactly \$3,000?

The table shows some values of  $f(x)$ , Jake's account balance based on  $x$ , the numbers of years the money has been invested.

NUMBER OF YEARS $x$	ACCOUNT BALANCE (DOLLARS) $f(x)$
0	1500
1	1552.50
2	1606.84
3	1663.08
4	1721.28
5	1781.53
6	1843.88
7	1908.42

9. When will Jake's account balance reach \$1800?

10. When will Jake's account balance reach \$1650?

Use the scenario below to complete questions 11 – 15.



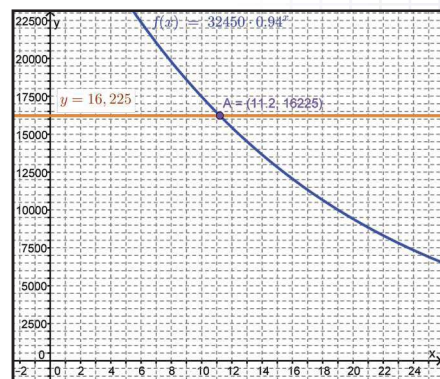
### FINANCE

Oliver purchased a luxury sedan for \$32,450. After doing some research he discovered the vehicle will depreciate by 6% each year. The function  $f(x)$  represents the value of the vehicle after  $x$  years since it was purchased.

$$f(x) = 32,450(0.94)^x$$

11. Write an equation that can be used to determine when the vehicle will be worth half of what Oliver paid for it.

12. The graph represents  $f(x)$  and  $y = 16,225$ . What does point  $A$  represent in the situation?



The table represents the value of the vehicle at the end of  $x$  years after purchase.

NUMBER OF YEARS, $x$	1	2	3	4	5	6	7
VALUE OF VEHICLE (DOLLARS), $f(x)$	30503.00	28672.82	26952.45	25355.30	23815.19	22386.27	21043.10

13. During which year will the vehicle first be worth less than \$30,000?
14. During which year will the vehicle first be worth less than \$25,000?
15. During which year will the vehicle be worth exactly \$22,000?

Use the scenario below to complete questions 16 – 20.



## **WILDLIFE MANAGEMENT**

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A herd of deer contains 300 deer. The population of the herd increases at a rate of 15% per year assuming that there are no deaths among the herd. The function  $f(x)$  represents the deer population after  $x$  years. The function below represents this situation.

$$f(x) = 300(1.15)^x$$

16. Use graphing technology to plot the function.
17. Use a graphing calculator and the intersection feature to determine when the deer population will reach 425.
18. Use a graphing calculator and the intersection feature to determine when the deer population will reach 500.
19. Use a graphing calculator and the intersection feature to determine when the deer population will double.
20. Use a graphing calculator and the table feature, determine during which year the deer population will exceed 2,000.