3.6 Homework Handout : Appreciation and Depreciation

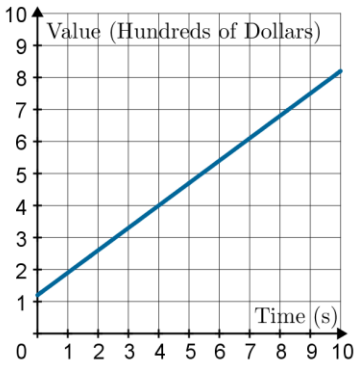
PART A

1) Is the value of a house increasing over time an example of appreciation or depreciation? Explain.

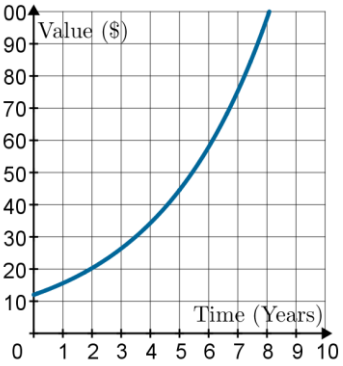
2) Is the annual decrease in the value of a car an example of appreciation or depreciation? Explain.

3) State whether each of the following graphs displays appreciation or depreciation.

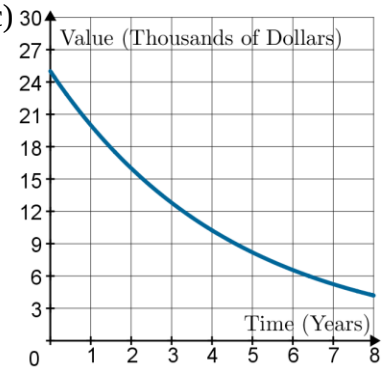
a)



b)



c)

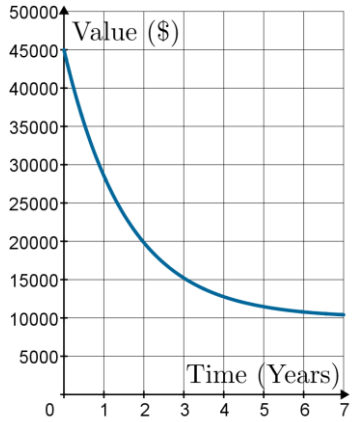


PART B

4) A collectible comic book that is currently worth $45 is expected to double in value every year over the next decade.

a) Will the comic book appreciate or depreciate over the next decade? Explain.
b) How much will the comic book be worth 8 years from now?
c) In how many years will the comic book be worth $720?
d) Over the next decade, is the relationship between time and the value of the comic book linear or non-linear? Explain.

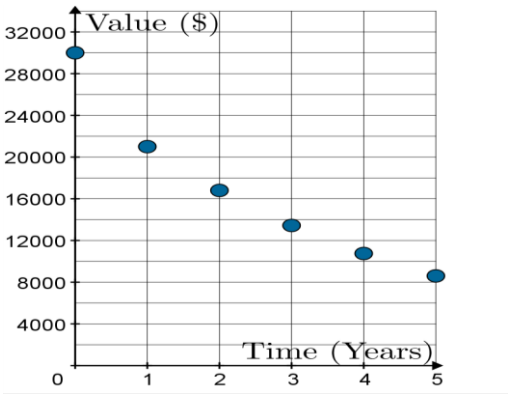
5) The graph on the right shows the value of a piece of machinery for seven years from its initial purchase.



a) Does the machine appreciate or depreciate over time? Explain.
b) What is the value of the machine when it is first purchased?
c) What is the approximate value of the machine two years after it is purchased?
d) Describe what happens to the rate of appreciation/depreciation over time.
e) Approximately what percentage of the machine's value has been lost three years after it is purchased?

6) The value of a sports card that is currently worth $45 is expected to increase by $10 every year.
a) Is the card's value an example of appreciation or depreciation?
b) State whether the card's appreciation/depreciation is linear or non-linear.
c) Sketch a graph to display the value of the card over 5 years.
d) Write an equation to model the card's value *t* years from now.
e) Use your equation to determine how long it will take for the card to reach a value of $300.

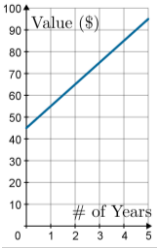
7) The graph on the right shows the value of a new car from the time it is purchased.
   a) During what year did the car experience the greatest depreciation?
   b) By what percentage did the car depreciate in the first year of ownership?
   c) If the value of the car two years after purchase is $16 800, by what percentage did the car depreciate in the second year?



8) A computer has a depreciation rate of approximately 2% per week. That is, each week the computer loses 2% of the value it had the previous week. When purchased, the computer has value is $840.
   a) Determine the value of the computer 4 weeks after it is purchased.
   b) What percentage of the computer's value is maintained from week to week?
   c) Using your answer from part (b), write an equation to model the value of the computer *t* weeks after it is purchased.
   d) Use your equation from part (c) to determine the value of the computer one year after it is purchased.

9) When purchased, a piece of fine art was valued at $1500. Each year, its value increased by 7.5% of its value the previous year.
   a) Determine the value of the artwork 10 years after it was purchased.
   b) Determine an equation to model the value of the artwork *t* years after it was purchased.
   c) Another piece of artwork that was also worth $1500 when purchased appreciated in value to $4785.08 over 10 years. By what percentage did the value increase each year?

ANSWERS

1) Appreciation, since the value is increasing over time.
2) Depreciation, since the value is decreasing over time.
3) a) appreciation b) appreciation c) depreciation
4) a) Appreciate, since the value will increase over time. b) $11 520 c) 4
d) Non-linear, since the value increases by a different (greater) amount each year.
5) a) Depreciate, since the value decreases over time. b) $45 000 c) $20 000
d) The rate of depreciation approaches zero. e) approximately 67%
76 a) appreciation b) linear c) 

d) $V = 10t + 45$ e) 25.5 years
7) a) first year b) 30% c) 20%
8) a) $774.79 b) 98% c) $V = 840 \times 0.98^t$ d) $293.79
9) a) $3091.55 b) $V = 1500 \times 1.075^t$ c) 12.3%