

1. Allen is on the football team this year but he has poor time management skills. His mother told him that he is off the team if he fails anything in school. On his first math quiz he earned a 90, then he earned an 86 and an 82 on his next quiz.

- a. Is this discrete or continuous? _____
- b. Is this arithmetic, geometric, or neither? _____
- c. Write an equation for the function. _____
- d. Find $f(7)$. _____.
- e. Explain the meaning of your answer.
- f. Find x if $f(x) = 58$. _____
- g. Explain the meaning of your answer. How does this impact Allen?

2. A recovering heart attack patient is told to get on a regular walking program. The patient is told to walk a distance of 5 km the first week, 8 km the second week, 11 km the third week and so on for a period of 10 weeks. The equation for this scenario is given below.

$$d(w) = 2 + 3w$$

- a. Find $d(7)$.
- b. What does this value mean in the context of the problem?
- c. If $d(w) = 29$, what is w ?
- d. What does this value mean in the context of the problem?

3. If groceries now cost Mr. Belby \$275 per week, he predicts that the cost will increase 10% per year due to inflation **AND** his 3 growing boys eating more and more each year.
- Is this discrete or continuous? _____
 - Is this arithmetic, geometric, or neither? _____
 - Write an equation for the function. _____
 - Find $f(10)$. _____.
 - Explain the meaning of your answer.
 - Find x if $f(x) = \$535.90$. _____
 - Explain the meaning of your answer.

4. The first year a toy manufacturer introduces a new toy; its sales total \$495,000. The company expects its sales to drop 10% each succeeding year. The equation for this scenario is given below.

$$d(y) = 550,000(0.9)^y$$

- Find $d(3)$.
- What does this value mean in the context of the problem?
- If $d(y) = \$292,293$ what is y ?
- What does this value mean in the context of the problem?

5. Mr. Belby buys a new BMW for \$51,000 dollars. The car loses 22% of its value each year.

- a. Is this discrete or continuous? _____
- b. Is this arithmetic, geometric, or neither? _____
- c. Write an equation for the function. _____
- d. Find $f(18)$. _____.
- e. Explain the meaning of your answer.
- f. Find x if $f(x) = \$3316$. _____
- g. Explain the meaning of your answer.

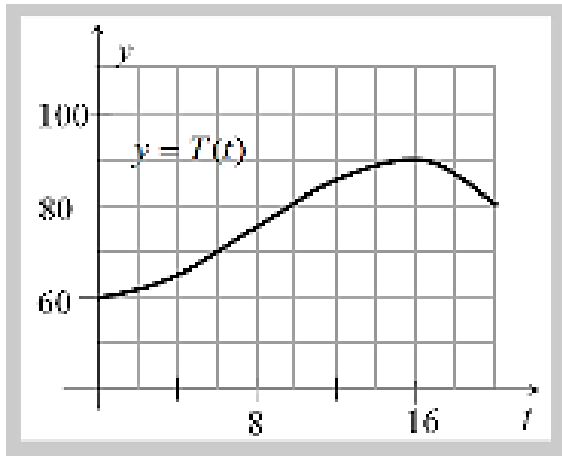
6. Mrs. Pischke loads \$150 on a coffee hound gift card. She spends \$8.50 at coffee hound each week. The equation for this scenario is given below.

$$d(w) = 150 - 8.50w$$

- a. Find $d(3)$. Find $d(20)$.
- b. What do these values mean in the context of the problem?
- c. If $d(w) = \$0$, what is w ?
- d. What does this value mean in the context of the problem?

APPLICATION

7. The figure shows the graph of T , the temperature (in degrees Fahrenheit) over one particular 20-hour period in Phoenix as a function of time t .



Define the variables:

$T =$ _____

$t =$ _____

- Is the graph a function? Explain why or why not.
 - $t = 0$ corresponds to midnight. Estimate $T(20)$ and what would we mean by $T(20)$ in context?
 - What is the y-intercept? What does it represent in context?
 - What is the highest temperature and at what time did it occur?
 - When was the temperature decreasing? Why?
 - If Anna wants to go for a two-hour hike and return before the temperature gets over 80 degrees, when should she leave?
 - Find t if $T(t)=70$.
8. Swine flu is attacking Porkopolis. The function below determines how many people have swine where $t =$ time in days and $S =$ the number of people in thousands.
- $$S(t) = 9t - 4$$
- Find $S(4) =$
 - What does $S(4)$ represent in the context of the problem?
 - Find t when $S(t) = 23$
 - What does $S(t) = 23$ represent?
 - Graph the function.

