

1.14 Function Model Construction

AP Precalculus – Calculator Allowed

Name: _____

CA #1

Graph the data and choose the regression that best fits the data.

- 1.
- | x | $f(x)$ |
|-----|--------|
| 14 | 48 |
| 18 | 50 |
| 28 | 53 |
| 33 | 64 |
| 35 | 70 |
| 38 | 75 |
| 41 | 84 |
| 48 | 105 |
| 53 | 138 |
- a. Is the data Linear, Quadratic, or Cubic ?
- b. Write the equation of the regression curve.
- c. Use your equation to find the average rate of change from 20 to 40.

2. College students were asked how many classes they missed semester one and their grade in class.
- | Missed Classes | Grade % |
|----------------|---------|
| 1 | 88 |
| 1 | 91 |
| 3 | 82 |
| 4 | 79 |
| 6 | 73 |
| 6 | 71 |
| 8 | 65 |
- a. Is the data Linear, Quadratic, or Cubic ?
- b. Write the equation of the regression curve.
- c. Use your equation to predict the grade of college student that misses 5 classes.

Construct an inversely proportional model to answer the following.

3. The value of y is inversely proportional to product of 4 and x squared. If $y = 12$ when $x = 2$, then find the value of y when $x = 6$
4. The time it takes to mow a lawn is inversely proportional to the number of workers. If it takes 3 workers 45 minutes to mow a lawn, how long will it take for 4 workers to mow the lawn?

Use the piecewise function to answer the following.

5.

$$f(x) = \begin{cases} \sqrt{x+1}, & 0 \leq x \leq 3 \\ 2x - 4, & 3 < x < 10 \\ 16, & 10 \leq x \leq 12 \end{cases}$$

a. Find $f(3)$.

b. Find $f(6)$.

6. A fast food company pays \$12 per hour for regular pay.
Overtime pay is time and half.

a. Find $P(48)$.

$$P(h) = \begin{cases} 12h, & 0 \leq h \leq 40 \\ 18(h - 40) + 480, & m > 40 \end{cases}$$

b. Find $P(40)$.

Answers to 1.14 CA #1

1. a. Quadratic b. $f(x) = 0.073x^2 - 2.754x + 73.845$ c. 1.626	2. a. Linear b. $f(x) = -3.487x + 92.873$ c. 75.438%
3. 1.333	4. 33.75 minutes
5. a. $f(3) = 2$ b. $f(6) = 8$	6. a. $P(48) = 624$ b. $P(40) = 480$