

## Quadratic Regression Practice Worksheet

Name Key

Date \_\_\_\_\_

Amery recorded the distance and height of a basketball when shooting a free throw.

Distance(feet), x	Height (feet), f(x)
0	4
2	8.4
6	12.1
9	14.2
12	13.2
13	10.5
15	9.8

1. Find the quadratic equation for the relationship of the horizontal distance and the height of the ball. Round to 3 decimal places.

$$f(x) = -0.118x^2 + 2.112x + 4.215$$

2. Using this function what is the approximate maximum height of the ball?

13.665 feet

This table shows the population of a city every ten years since 1970.

Years Since 1970, x	Population (In thousands), y
0	489
10	801
20	1,202
30	1,998
40	2,959

3. Find the best-fitting quadratic model for the data. Round to 3 decimal places.

$$y = 1.209x^2 + 13.000x + 504.257$$

4. Using this model, what will be the estimated population in 2020?

x = 50      4,176.8 thousand

5. Which of the following is best modeled by a **quadratic** function?

- A. Relationship between circumference and diameter.  $C = \pi d$
- B. Relationship between area of a square and side length.  $A = x^2$
- C. Relationship between diagonal of a square and side length.  $2x^2 = \text{diag.}^2$
- D. Relationship between volume of a cube and side length.  $V = s^3$

6. If y is a quadratic function of x, which value completes the table?

- A. 12  
B. 20  
C. 44  
 D. 48

x	-2	0	2	4	6
y	-8	0	12	28	

$$y = 0.5x^2 + 5x$$

$$y = \frac{1}{3}x^2 + 5x - 8$$

7. The graph of a quadratic function having the form  $f(x) = ax^2 + bx + c$  passes through the points  $(0, -8)$ ,  $(3, 10)$ , and  $(6, 34)$ . What is the value of the function when  $x = -3$ ?

A. -32

B. -26

**C. -20**

D. 10

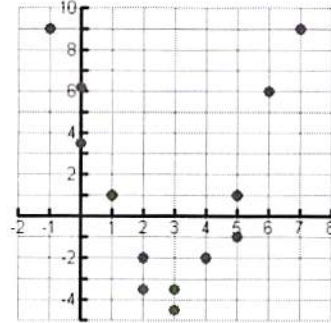
8. Which is the quadratic equation the best fits the scatterplot?

**A.  $f(x) = (x - 3)^2 - 4$   $(3, -4)$**

B.  $f(x) = (x + 3)^2 + 4$   $(-3, 4)$

C.  $f(x) = (x - 4)^2 - 3$   $(4, -3)$

D.  $f(x) = (x + 4)^2 + 3$   $(-4, 3)$



9. Which is the quadratic equation the best fits the scatterplot?

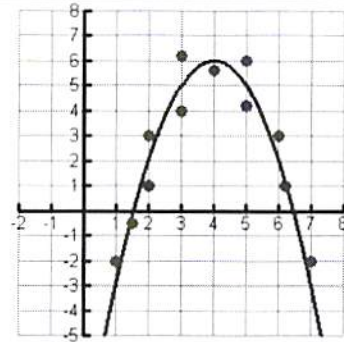
A.  $f(x) = x^2 - 8x + 22$

B.  $f(x) = -x^2 - 8x - 10$

C.  $f(x) = -x^2 + 8x - 32$

**D.  $f(x) = -x^2 + 8x - 10$**

Vertex:  
 $(4, 6)$



Write a quadratic equation that fits each set of points.

10.  $(0, -8)$ ,  $(2, 0)$ , and  $(-3, -5)$

$$y = x^2 + 2x - 8$$

11.  $(-1, -16)$ ,  $(2, 5)$ , and  $(5, 8)$

$$y = -x^2 + 8x - 7$$

12.  $(1, 4)$ ,  $(-2, 13)$ , and  $(0, 3)$

$$y = 2x^2 - x + 3$$

13.

x	-1	0	1	2	3
y	35	22	11	2	-5

$$y = x^2 - 12x + 22$$