

# 4-3

## Practice

Form G

### Modeling with Quadratic Functions

Find an equation in standard form of the parabola passing through the points.

1. (1, -1), (2, -5), (3, -7) *→ See page 2 for worked out solution*  
 $y = x^2 - 7x + 5$

3. (2, -8), (3, -8), (6, 4)  
 $y = x^2 - 5x - 2$

5. (-1, -12), (0, -6), (3, 0)  
 $y = -x^2 + 5x - 6$

7. (-1, -6), (0, 0), (2, 6)  
 $y = -x^2 + 5x$

9.

x	f(x)
-1	7
1	5
3	11

*y = x^2 - x + 5*

2. (1, -4), (2, -3), (3, -4)  
 $y = -x^2 + 4x - 7$

4. (-1, -12), (2, -6), (4, -12)  
 $y = -x^2 + 3x - 8$

6. (-2, -4), (1, -1), (3, 11)  
 $y = x^2 + 2x - 4$

8. (-3, 2), (1, -6), (4, 9)  
 $y = x^2 - 7$

10.

x	f(x)
-2	-7
0	1
2	1

*y = -x^2 + 2x + 1*

11.

x	f(x)
-1	-6
1	4
2	12

*y = x^2 + 5x - 2*

12.

x	f(x)
-2	-1
2	-1
3	9

*y = 2x^2 - 9*

13. The table shows the number  $n$  of tickets to a school play sold  $t$  days after the tickets went on sale, for several days.

- Find a quadratic model for the data.
- Use the model to find the number of tickets sold on day 7.
- When was the greatest number of tickets sold?

Day, $t$	Number of Tickets Sold, $n$
1	32
2	64
4	74

14. The table gives the number of pairs of skis sold in a sporting goods store for several months last year.

- Find a quadratic model for the data, using January as month 1, February as month 2, and so on.
- Use the model to predict the number of pairs of skis sold in November.
- In what month were the fewest skis sold?

Month, $t$	Number of Pairs of Skis Sold, $s$
Jan	82
Mar	42
May	18

①  $(1, -1), (2, -5), (3, -7)$

$$y = ax^2 + bx + c$$

$(1, -1)$

$$-1 = a(1)^2 + b(1) + c$$

$$-1 = a + b + c$$

$x-1$

~~$$-1 = a + b + c$$~~

$$1 = -a - b - c$$

~~$$-1 = a + b + c$$~~

$$-1 = 1 - 7 + c$$

$$-1 = -6 + c$$

$$+6 \quad +6$$

$$\boxed{5 = c}$$

$(2, -5)$

$$-5 = a(2)^2 + b(2) + c$$

$$-5 = 4a + 2b + c$$

$$1 = -a - b - c$$

$$-4 = 3a + b$$

$x-2$

$$-4 = 3(1) + b$$

$$-4 = 3 + b$$

$$-3 \quad -3$$

$$\boxed{-7 = b}$$

$(3, -7)$

$$-7 = a(3)^2 + b(3) + c$$

$$-7 = 9a + 3b + c$$

$$1 = -a - b - c$$

$$-6 = 8a + 2b$$

$$8 = -6a - 2b$$

$$\frac{2}{2} = \frac{2a}{2}$$

$$\boxed{1 = a}$$

$$\boxed{y = x^2 - 7x + 5}$$