Name _____ Class _____ Date _____

# Practice 5-1

**Modeling Data with Quadratic Functions**

**Find a quadratic model for each set of values.**

**1.** $(-1, 1), (1, 1), (3, 9)$

**2.** $(-4, 8), (-1, 5), (1, 13)$

**3.** $(-1, 10), (2, 4), (3, -6)$

**4.**

| $x$ | –1 | 0 | 2 |
|---|---|---|---|
| $f(x)$ | 1 | –1 | 7 |

**5.**

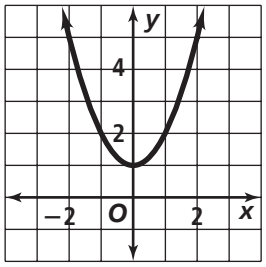
| $x$ | –4 | 0 | 1 |
|---|---|---|---|
| $f(x)$ | 1 | 9 | 16 |

**6.**

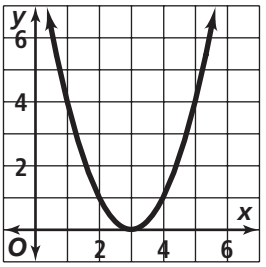
| $x$ | –1 | 2 | 3 |
|---|---|---|---|
| $f(x)$ | 12 | 3 | 4 |

**Identify the vertex and the axis of symmetry of each parabola.**

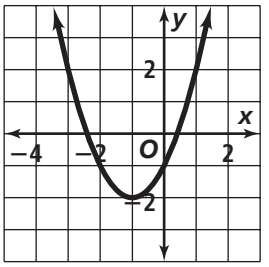
**7.**




**8.**




**9.**




**Determine whether each function is linear or quadratic. Identify the quadratic, linear, and constant terms.**

**10.** $y = (x - 2)(x + 4)$

**11.** $y = 3x(x + 5)$

**12.** $y = 5x(x - 5) - 5x^2$

**13.** $f(x) = 7(x - 2) + 5(3x)$

**14.** $f(x) = 3x^2 - (4x - 8)$

**15.** $y = 3x(x - 1) - (3x + 7)$

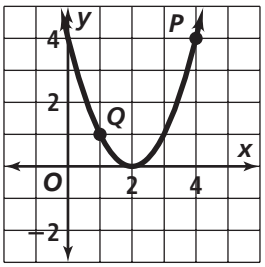
**16.** $y = 3x^2 - 12$

**17.** $f(x) = (2x - 3)(x + 2)$

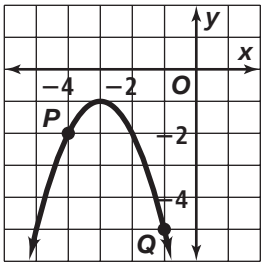
**18.** $y = 3x - 5$

**For each parabola, identify points corresponding to *P* and *Q*.**

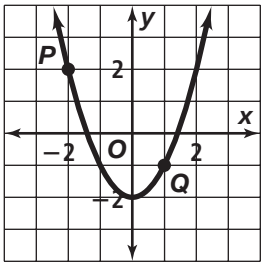
**19.**




**20.**




**21.**




**22.** A toy rocket is shot upward from ground level. The table shows the height of the rocket at different times.

| **Time (seconds)** | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| **Height (feet)** | 0 | 256 | 480 | 672 | 832 |

**a.** Find a quadratic model for this data.

**b.** Use the model to estimate the height of the rocket after 1.5 seconds.