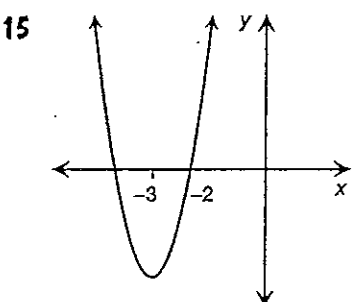
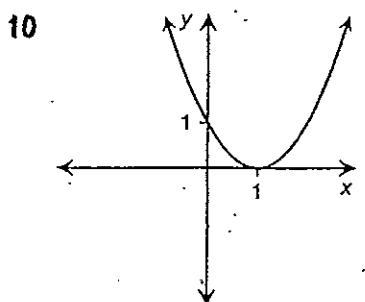
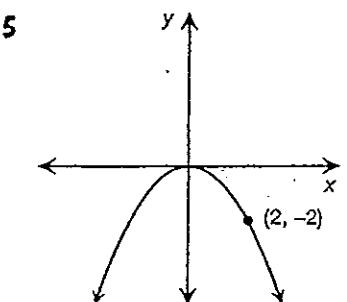
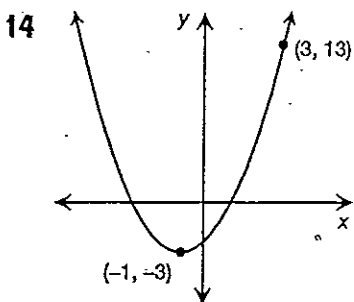
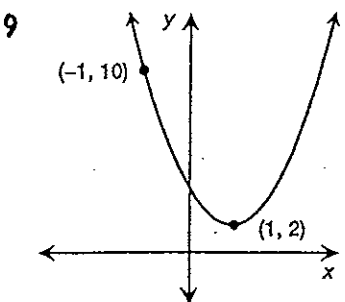
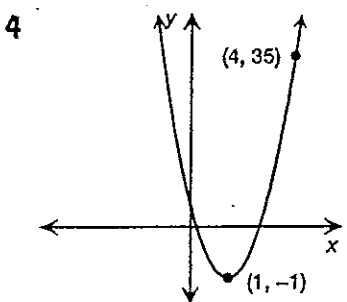
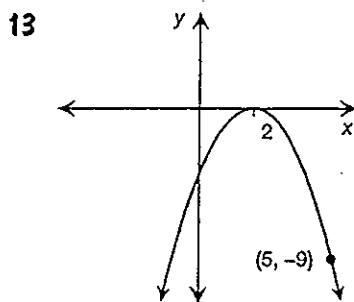
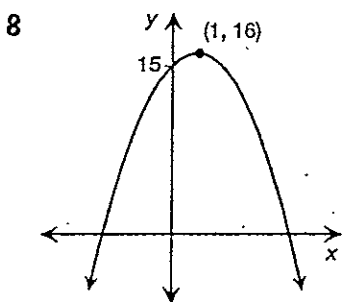
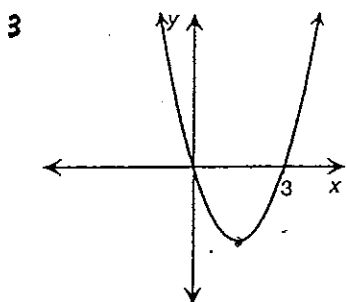
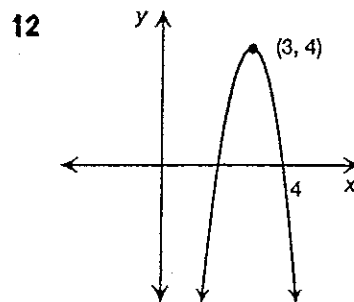
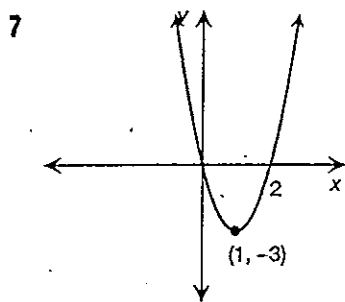
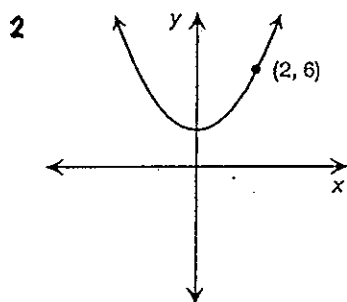
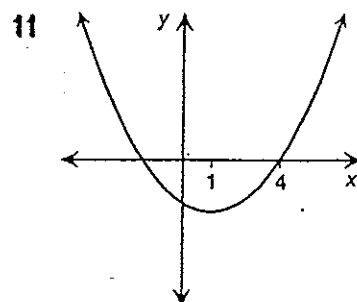
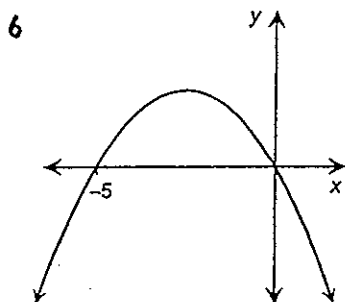
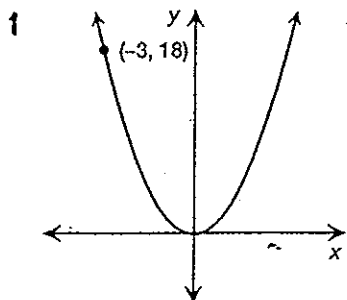


9.2

A page of parabolas

Find an equation of the form $y = ax^2 + bx + c$ for each of the parabolas on this page. Graphics calculators or computer graphing software may be used if available.



$$\textcircled{1} y = 2x^2 \checkmark$$

$$\textcircled{2} y = x^2 + 2 \checkmark$$

$$\textcircled{3} x = \frac{-b}{2a}$$

$$\frac{3}{2} = \frac{-b}{2a}$$

$$b = -3a \quad c = 0$$

$$y = ax^2 + bx \checkmark$$

$$0 = a(3)^2 + b(3)$$

$$0 = 9a - 9a$$

$$\therefore \text{true for all } a.$$

$$y = x^2 - 3x \checkmark$$

$$\textcircled{4} x = \frac{-b}{2a}$$

$$1 = \frac{-b}{2a}$$

$$b = -2a \checkmark$$

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

$$35 = a(4)^2 + b(4) + c$$

$$* 35 = 8a + c \checkmark$$

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

$$* -1 = -a + c$$

$$36 = 9a$$

$$a = 4 \quad b = -8 \quad c = 3 \checkmark$$

$$y = 4x^2 - 8x + 3 \checkmark$$

$$\textcircled{5} b = 0 \quad c = 0$$

$$y = ax^2 \checkmark$$

$$-2 = a(2)^2$$

$$a = -\frac{1}{2}$$

$$y = -\frac{1}{2}x^2 \checkmark$$

$$\textcircled{6} x = \frac{-b}{2a}$$

$$-\frac{5}{2} = \frac{-b}{2a}$$

$$b = 5a \quad c = 0 \checkmark$$

$$y = ax^2 + bx$$

$$0 = a(-5)^2 + b(-5)$$

$$0 = 25a - 25a$$

$$\therefore \text{True for all } a.$$

$$a = 1 \quad b = -5 \checkmark$$

$$y = x^2 - 5x \checkmark$$

$$\textcircled{7} x = \frac{-b}{2a}$$

$$1 = \frac{-b}{2a}$$

$$b = -2a \quad c = 0 \checkmark$$

$$y = ax^2 + bx$$

$$-3 = -a$$

$$a = 3 \quad b = -6 \checkmark$$

$$y = 3x^2 - 6x$$

$$\textcircled{8} x = \frac{-b}{2a}$$

$$1 = \frac{-b}{2a} \checkmark$$

$$b = -2a \quad c = 15$$

$$y = ax^2 + bx + 15$$

$$16 = -a + 15 \checkmark$$

$$a = -1 \quad b = 2$$

$$y = -x^2 + 2x + 15 \checkmark$$

$$\textcircled{9} x = \frac{-b}{2a}$$

$$1 = \frac{-b}{2a}$$

$$b = -2a \checkmark$$

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

$$* 2 = -a + c \checkmark$$

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

$$\textcircled{10} x = \frac{-b}{2a}$$

$$1 = \frac{-b}{2a}$$

$$b = -2a \quad c = 1 \checkmark$$

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

$$0 = -a + 1$$

$$a = 1 \quad b = -2 \checkmark$$

$$y = x^2 - 2x + 1 \checkmark$$

$$\textcircled{11} x = \frac{-b}{2a}$$

$$1 = \frac{-b}{2a}$$

$$b = -2a \quad c = -2$$

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

$$0 = a(4)^2 + b(4) - 2$$

$$0 = 8a - 2$$

$$a = \frac{1}{4} \quad b = \frac{1}{2} \checkmark$$

$$y = \frac{1}{4}x^2 + \frac{1}{2}x - 2$$

$$* 10 = \frac{3}{2}a + c$$

$$-8 = -2a \quad 8 = 4a$$

$$a = \frac{2}{2} \quad b = -\frac{4}{2} \quad c = \frac{6}{2}$$

$$y = 4x^2 - 8x + 6$$

$$= 2x^2 + 4x + 4$$

$$\textcircled{12} \quad x = \frac{-b}{2a}$$

$$3 = \frac{-b}{2a}$$

$$b = -6a$$

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

$$4 = a(3)^2 + b(3) + c$$

$$* 4 = -9a + c$$

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

$$0 = a(4)^2 + b(4) + c$$

$$* 0 = -8a + c$$

$$4 = -a$$

$$a = -4 \quad b = 24 \quad c = -32$$

$$y = -4x^2 + 24x - 32$$

$$\textcircled{13} \quad x = \frac{-b}{2a}$$

$$b = -4a$$

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

$$0 = a(2)^2 + b(2) + c$$

$$* 0 = -4a + c$$

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

$$-9 = a(5)^2 + b(5) + c$$

$$* -9 = 5a + c$$

$$-9 = -9a$$

$$a = 1 \quad b = 4 \quad c = -4$$

$$y = x^2 + 4x - 4$$

$$\textcircled{14} \quad x = \frac{-b}{2a}$$

$$-1 = \frac{-b}{2a}$$

$$b = 2a$$

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

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

$$* -3 = -a + c$$

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

$$13 = a(3)^2 + b(3) + c$$

$$* 13 = 9a + 3c$$

$$-16 = -16a$$

$$a = 1 \quad b = 2 \quad c = -2$$

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

$$\textcircled{15} \quad y = (x+2)(x+4)$$