

For 1 - 3, graph the function. Clearly show the vertex, axis of symmetry, and 4 other points.

1. $y = x^2 - 6x + 7$

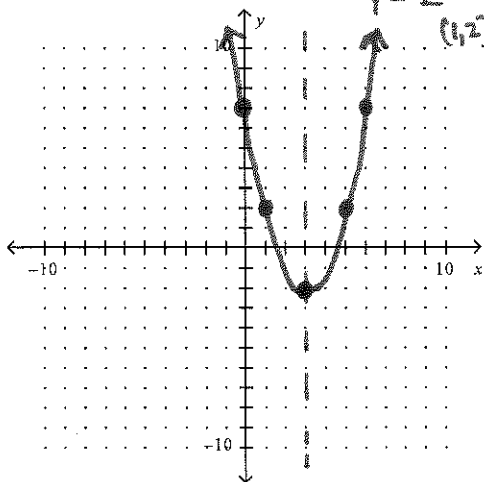
vertex: $\frac{-b}{2a} = \frac{6}{2(1)} = 3$

$(3, ?)$ $y = 3^2 - 6(3) + 7$
 $= 9 - 18 + 7 = -2$

$(3, -2)$ vertex

y-intercept = 7

Another point: $(1, ?)$ $y = 1^2 - 6(1) + 7$



2. $y = 2(x - 1)^2 - 4$

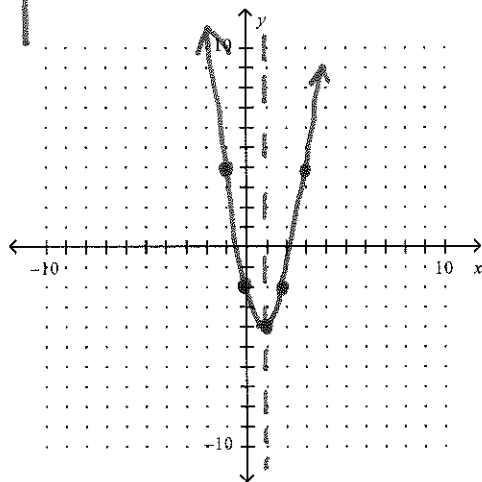
vertex: $(1, -4)$

Another point: $(0, ?)$

$y = 2(0 - 1)^2 - 4$
 $= -2$ $(0, -2)$

Another point: $(3, ?)$

$y = 2(3 - 1)^2 - 4$
 $= 8 - 4 = 4$ $(3, 4)$



3. $y = -2(x - 4)(x - 2)$

x-coordinate of vertex = $\frac{4+2}{2} = 3$

$(3, ?)$ $y = -2(3 - 4)(3 - 2)$
 $y = -2(-1)(1) = 2$

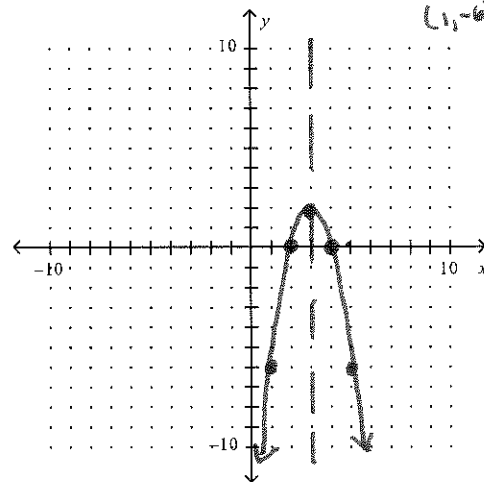
$(3, 2)$

x-intercepts: $(4, 0)$ and $(2, 0)$

Another point: $(1, ?)$

$y = -2(1 - 4)(1 - 2) = -6$

$(1, -6)$



Write the quadratic function in standard form.

4. $y = -2(x - 9)(x + 7)$

$y = -2(x^2 - 2x - 63)$

$y = -2x^2 + 4x + 126$

5. $y = -4(x + 6)(x - 8)$

$y = -4(x^2 - 2x - 48)$

$y = -4x^2 + 8x + 192$

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

$y = 3(x^2 - 8x + 16) - 8$

$y = 3x^2 - 24x + 48 - 8$

$y = 3x^2 - 24x + 40$

Solve the equation.

7. $x^2 + 13x + 36 = 0$

$$(x + 9)(x + 4) = 0$$

$$x = -9, -4$$

8. $x^2 - 9x + 14 = 0$

$$(x - 7)(x - 2) = 0$$

$$x = 7, 2$$

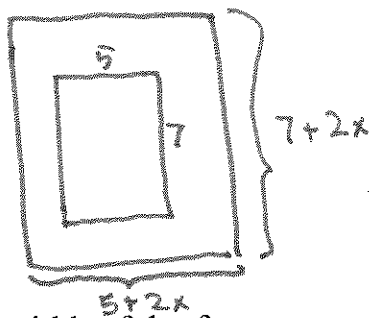
9. $3x^2 + 5x - 28 = 0$

$$(3x - 7)(x + 4) = 0$$

$$x = \frac{7}{3}, -4$$

10. You have a picture that is 5 inches by 7 inches. You want to make a frame for the picture that is of uniform width. Together, the pictures and the frame have an area of 99 square inches. Draw a picture to model the situation. What should be the width of the frame?

Draw a picture to model the situation.



$$(5 + 2x)(7 + 2x) = 99$$

Write and solve an equation to find the width of the frame.

$$(2x + 5)(2x + 7) = 99$$

$$4x^2 + 24x + 35 = 99$$

$$4x^2 + 24x - 64 = 0$$

$$4(x^2 + 6x - 16) = 0$$

$$4(x + 8)(x - 2) = 0$$

$$x = -8 \text{ or } 2$$

↑
impossible

2 inch wide frame