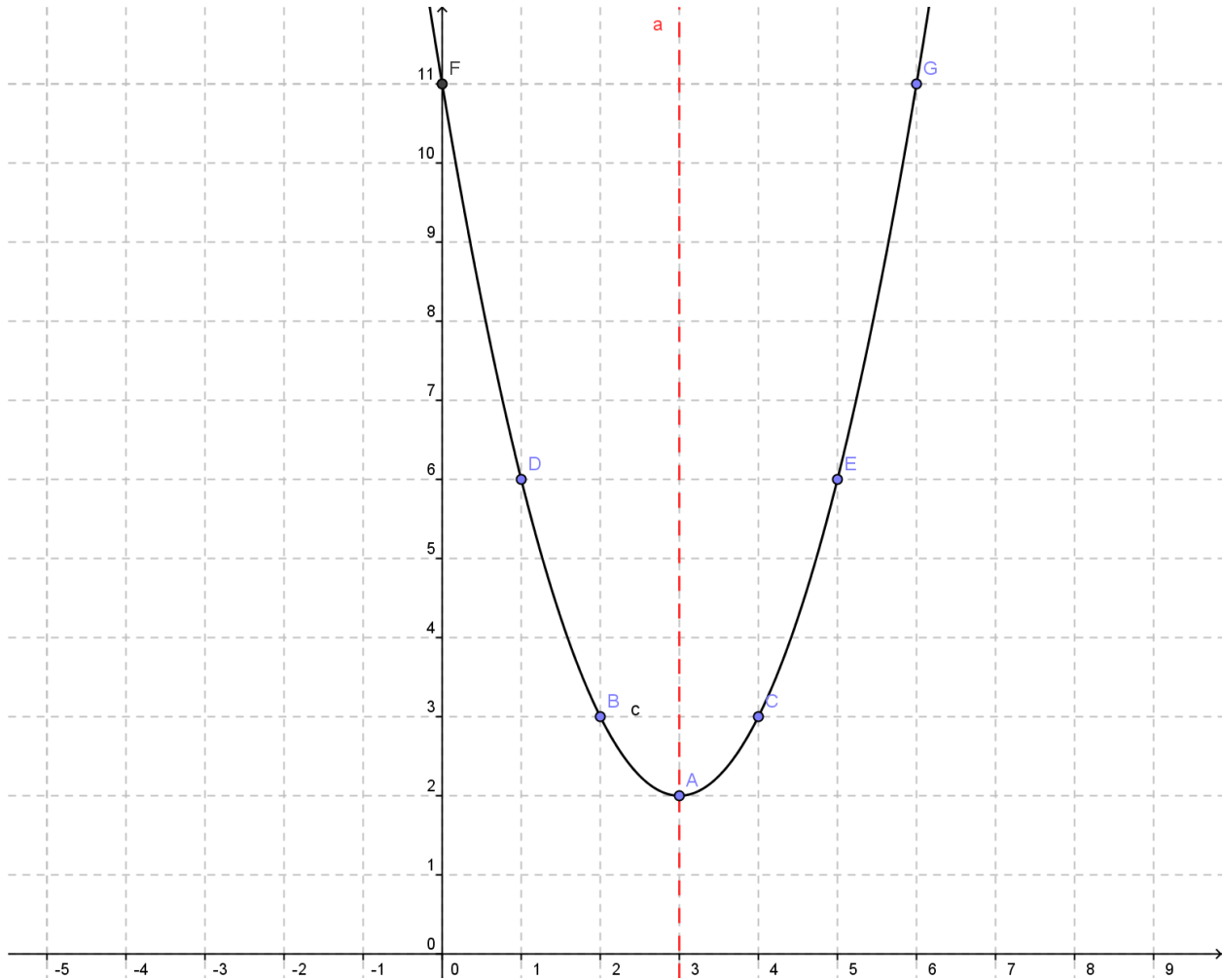
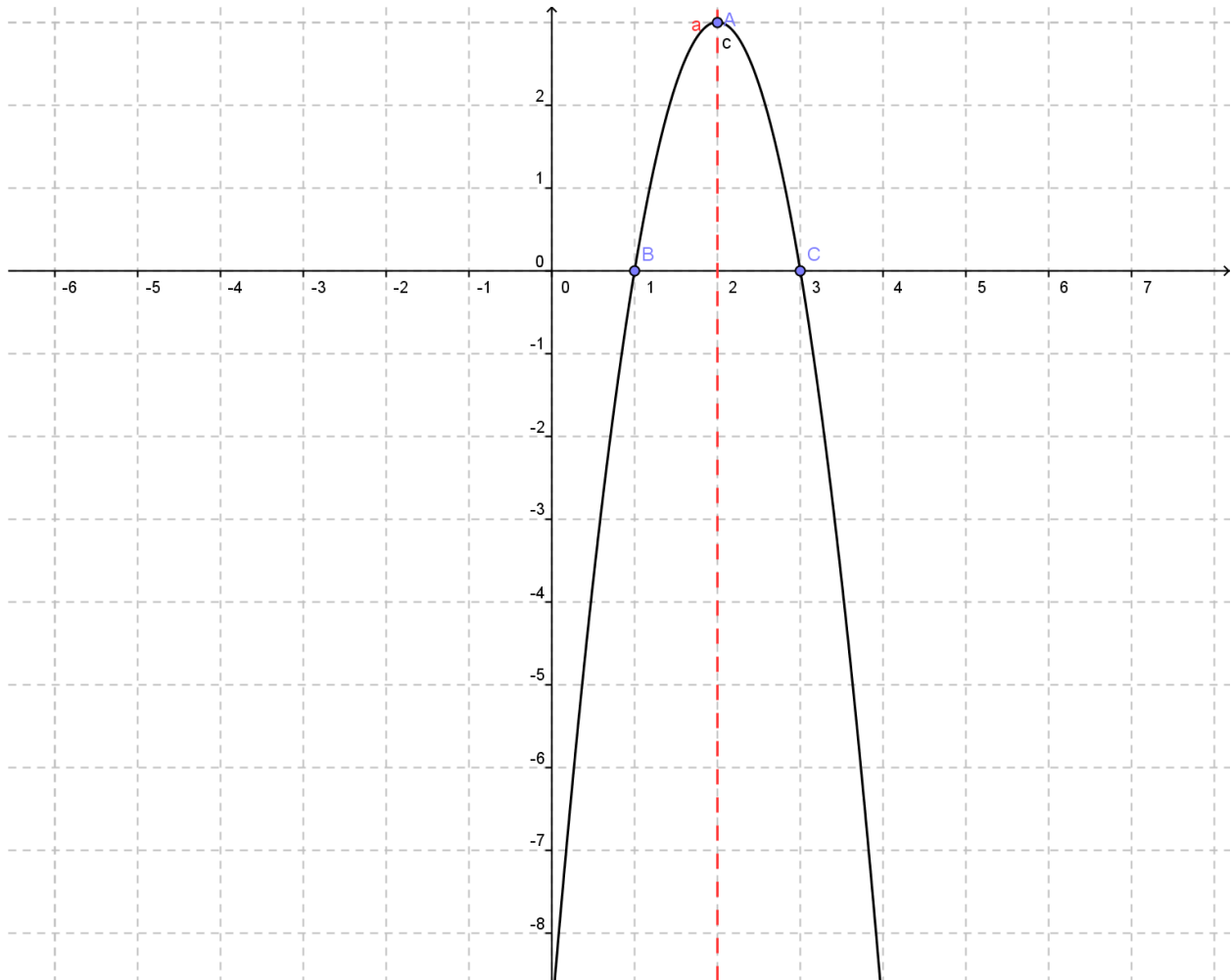


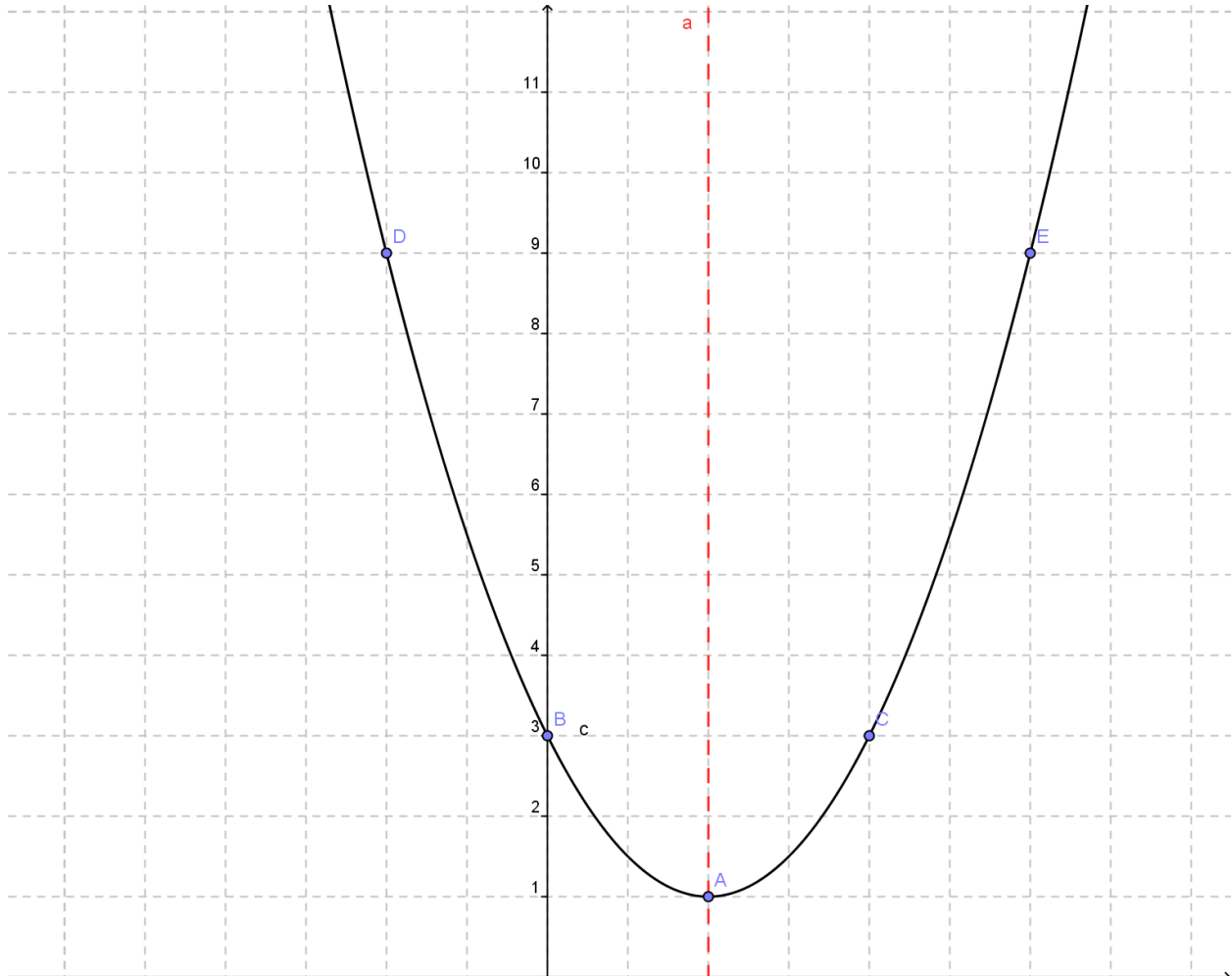
1. Vertex form: $y - 2 = (x - 3)^2$
Vertex: $(3, 2)$
Axis of symmetry: $x = 3$
Opens... Up
Compare to $y = x^2$: Same



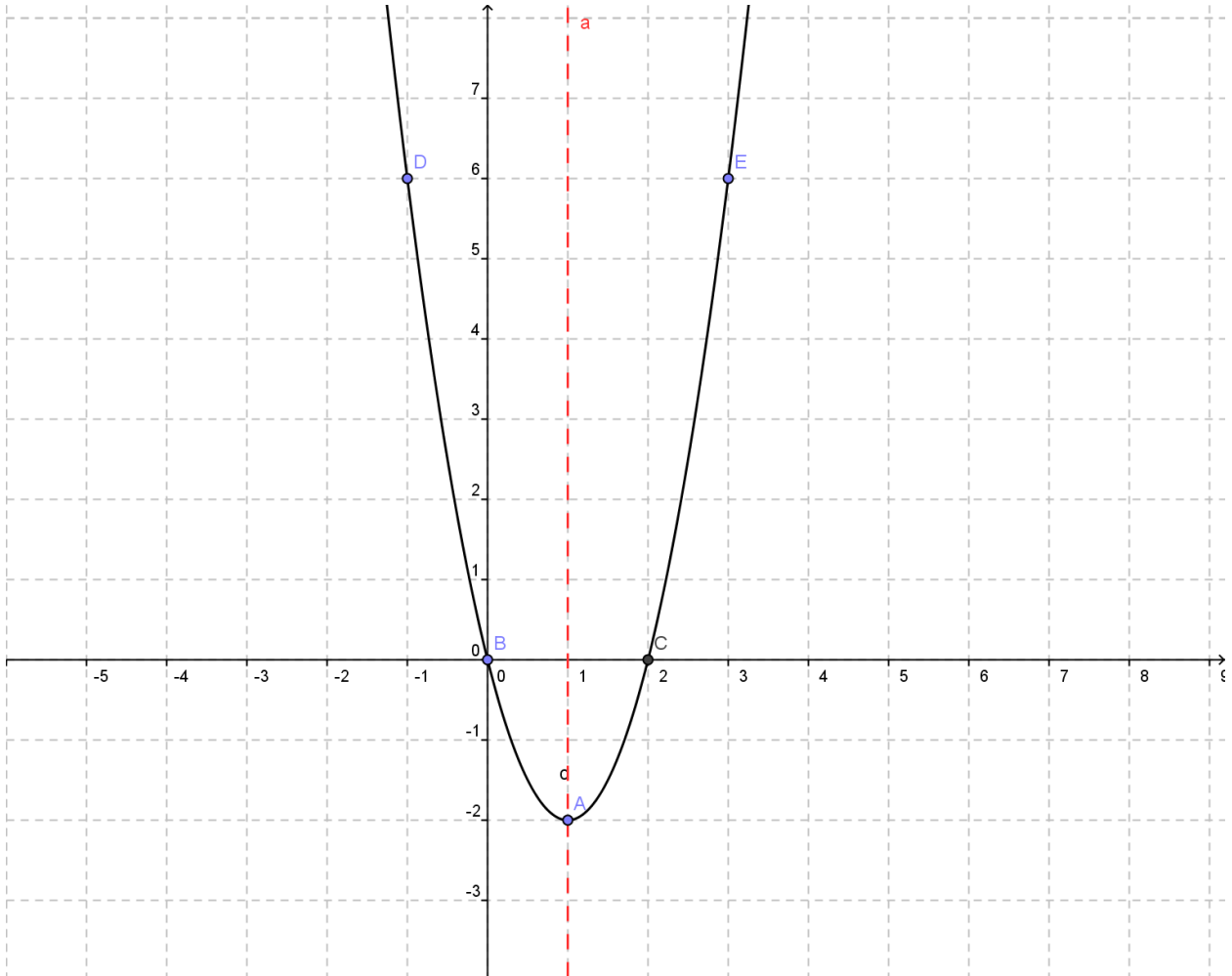
2. Vertex form: $y - 3 = -3(x - 2)^2$
Vertex: $(2, 3)$
Axis of symmetry: $x = 2$
Opens... Down
Compare to $y = x^2$: Narrower



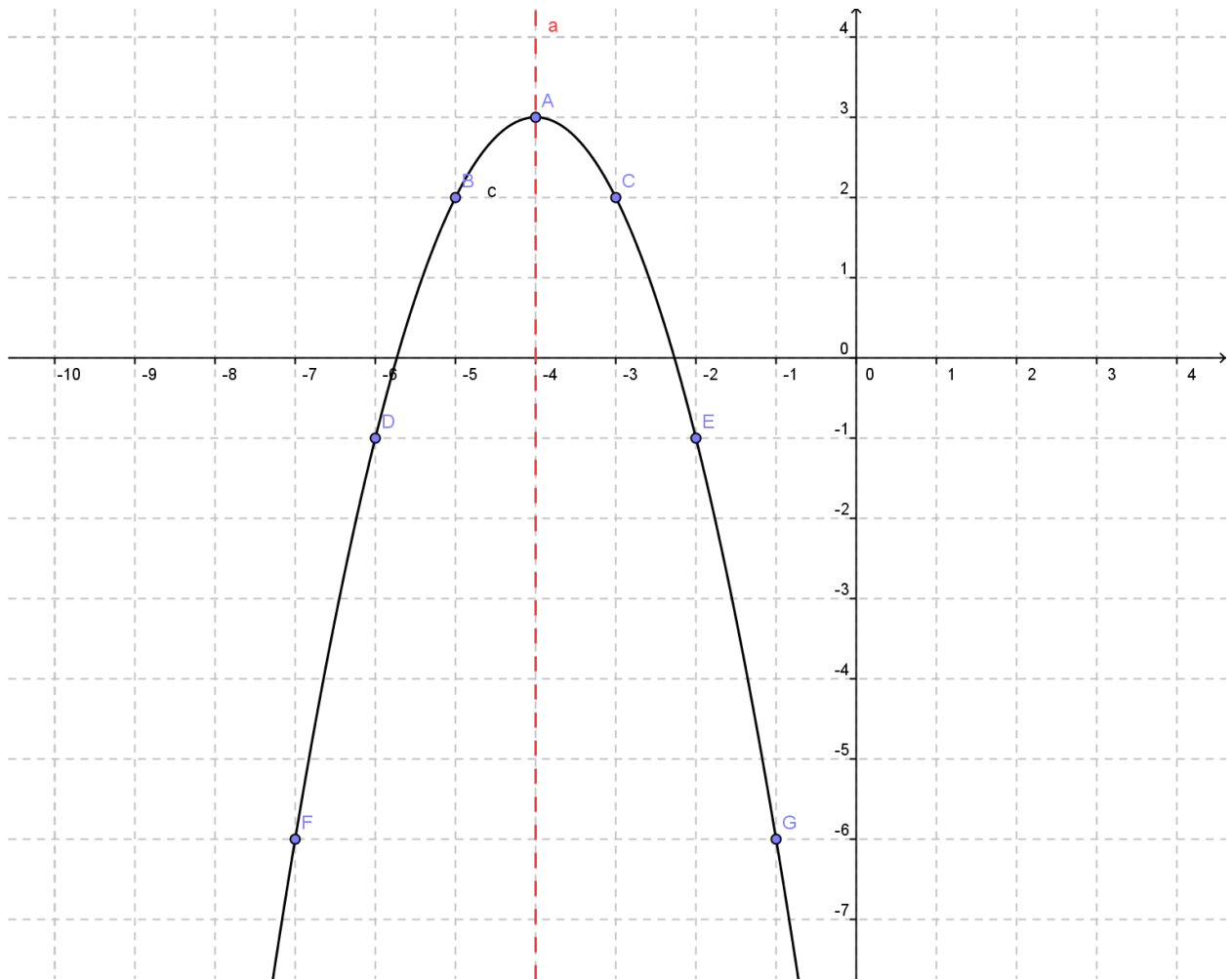
3. Vertex form: $y - 1 = \frac{1}{2}(x - 2)^2$
Vertex: $(2, 1)$
Axis of symmetry: $x = 2$
Opens... Up
Compare to $y = x^2$: Wider



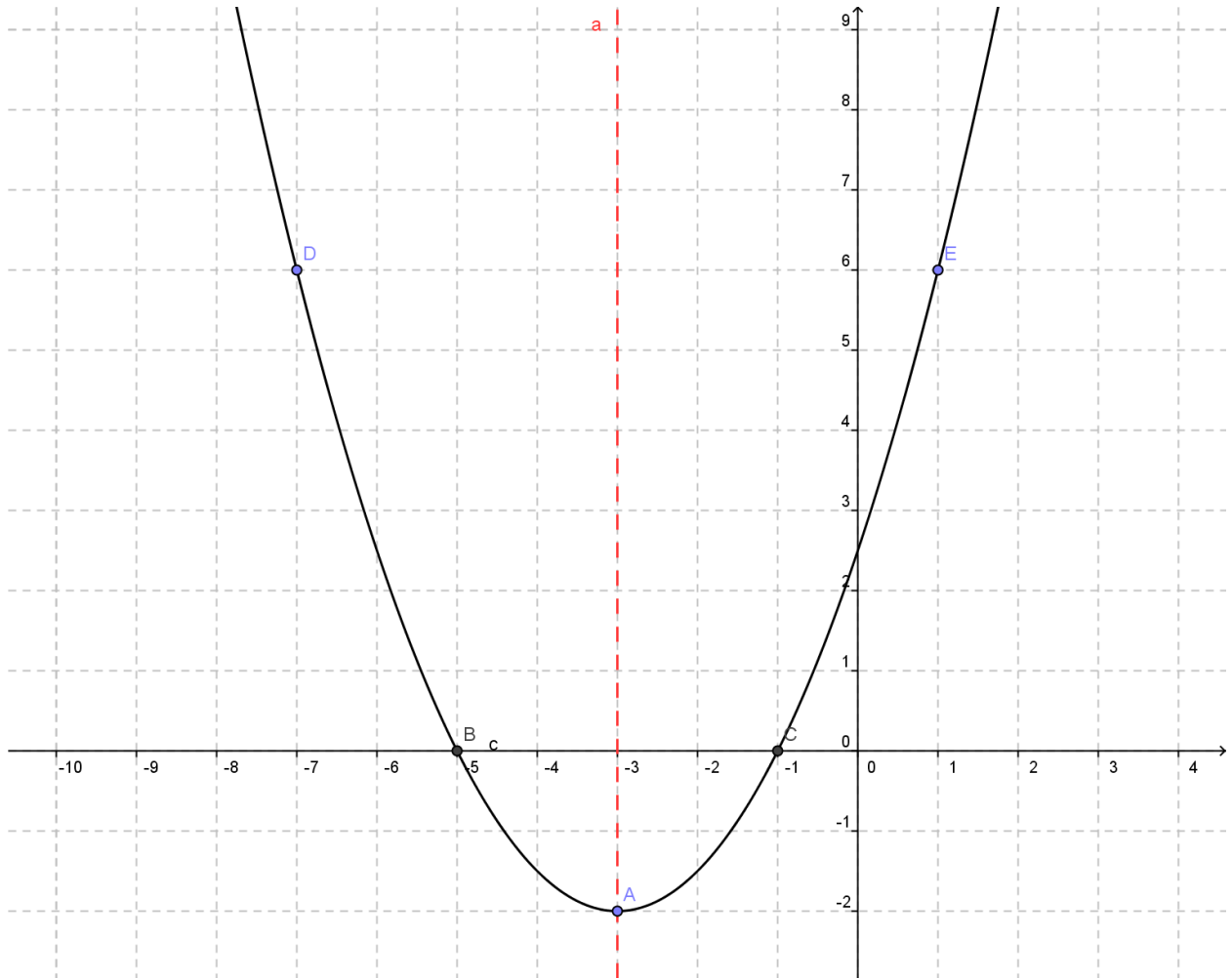
4. Vertex form: $y + 2 = 2(x - 1)^2$
Vertex: $(1, -2)$
Axis of symmetry: $x = 1$
Opens... Up
Compare to $y = x^2$: Narrower



5. Vertex form: $y - 3 = -(x + 4)^2$
Vertex: $(-4, 3)$
Axis of symmetry: $x = -4$
Opens... Down
Compare to $y = x^2$: Same



6. Vertex form: $y + 2 = \frac{1}{2}(x + 3)^2$
Vertex: $(-3, -2)$
Axis of symmetry: $x = -3$
Opens... Up
Compare to $y = x^2$: Wider



7. None

8. $x = 1, 3$

9. $x = -4 \pm \sqrt{3}$