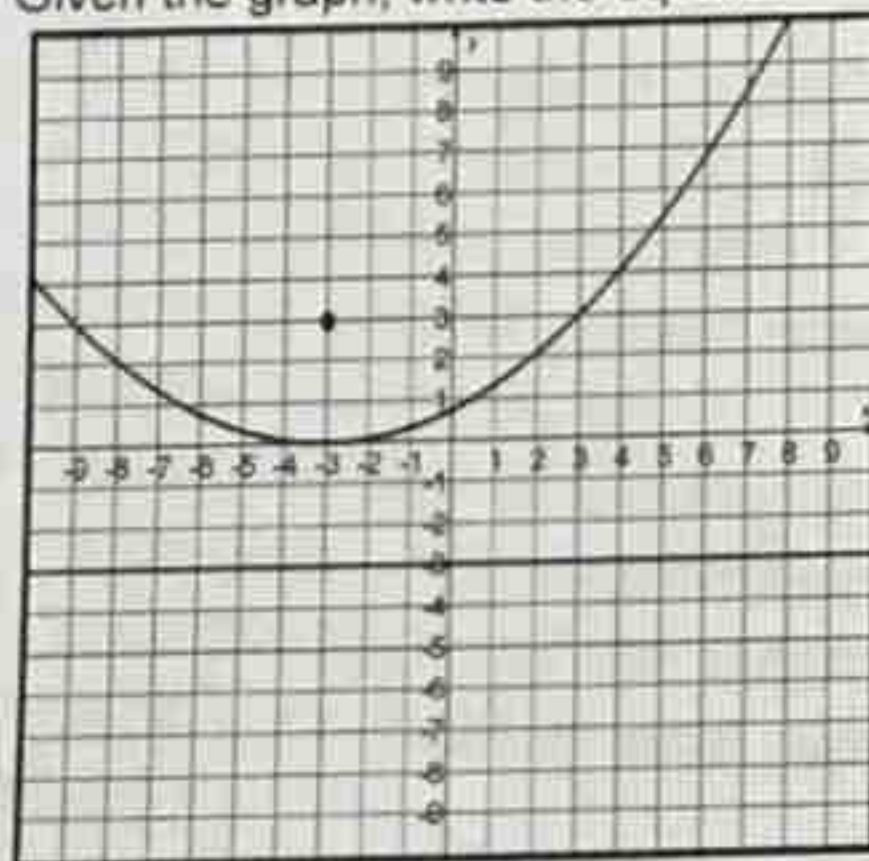
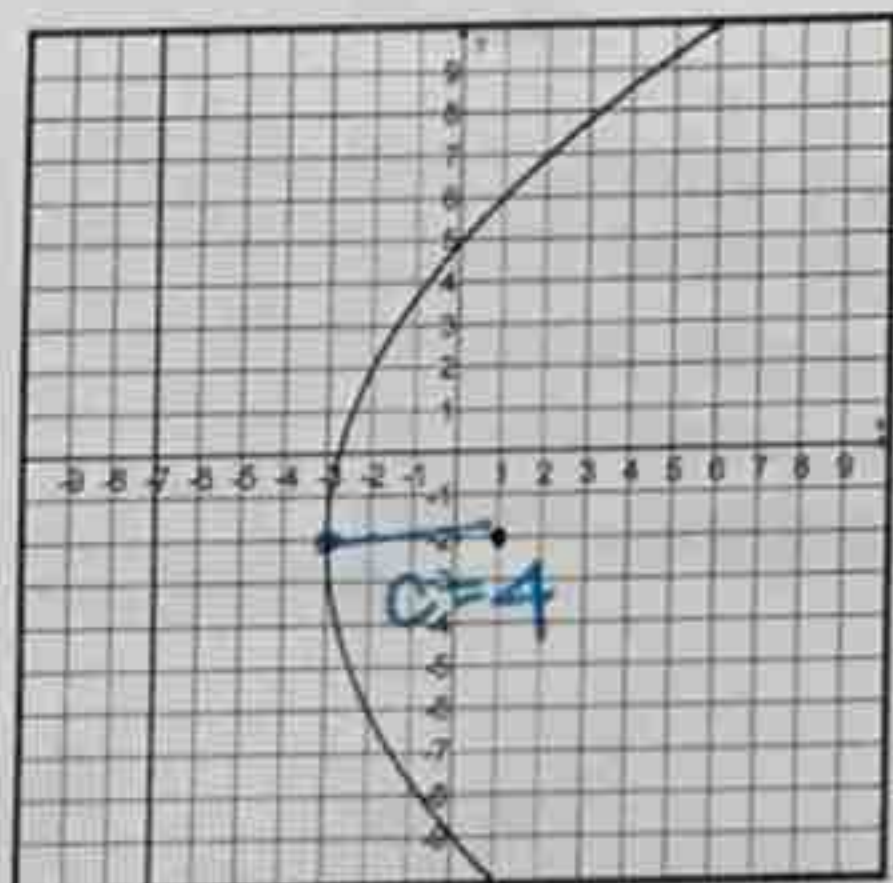


1. Given the graph, write the equation of the parabola and find all the critical values.



Vertex: $(-3, 0)$
 Focus: $(-3, 3)$
 Directrix: $y = -3$
 Axis of symmetry: $x = -3$
 Equation: $(x+3)^2 = 12(y)$
 Domain: $(-\infty, \infty)$
 Range: $[0, \infty)$

2. Given the graph, write the equation of the parabola and find all the critical values.

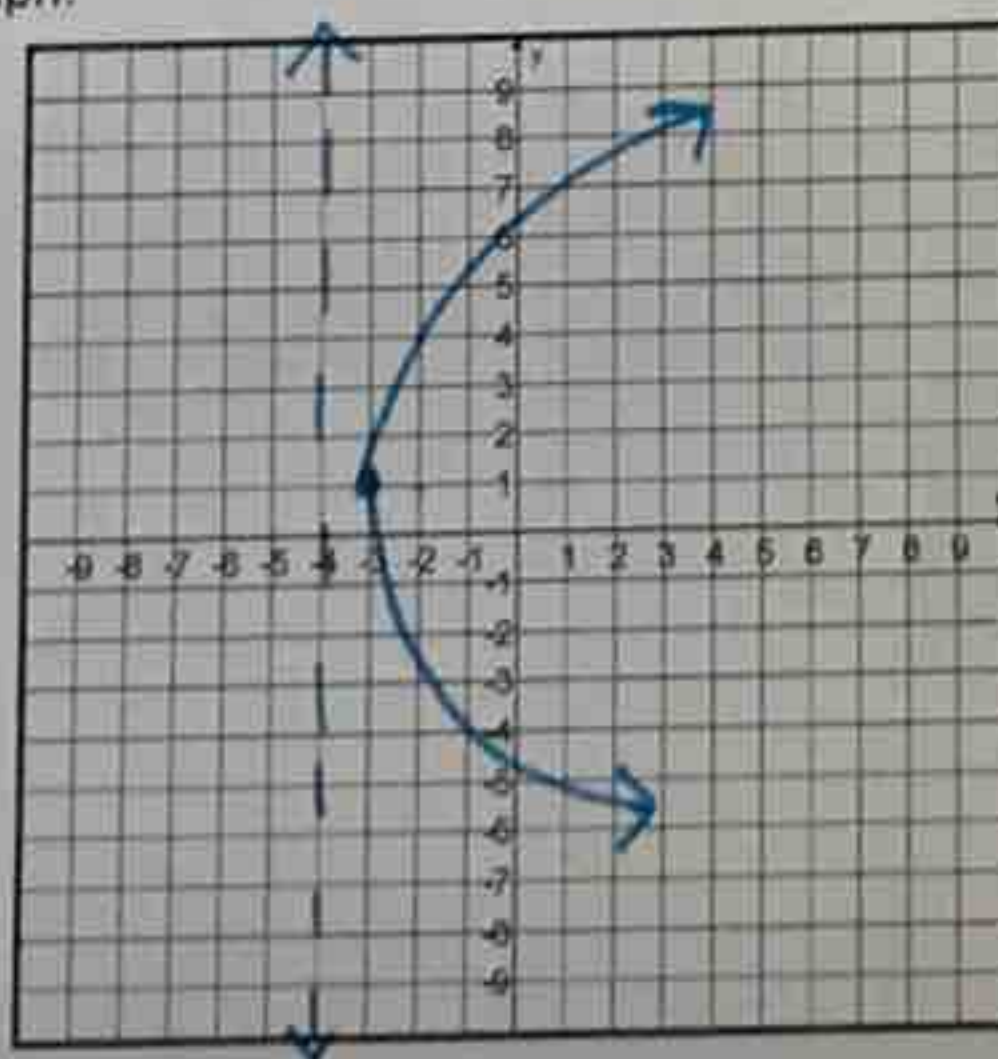


Vertex: $(-3, -2)$
 Focus: $(1, -2)$
 Directrix: $x = -7$
 Axis of Symmetry: $y = -2$
 Equation: $(y+2)^2 = 16(x+3)$
 Domain: $[-3, \infty)$
 Range: $(-\infty, \infty)$

Find the critical values for each parabola and then graph.

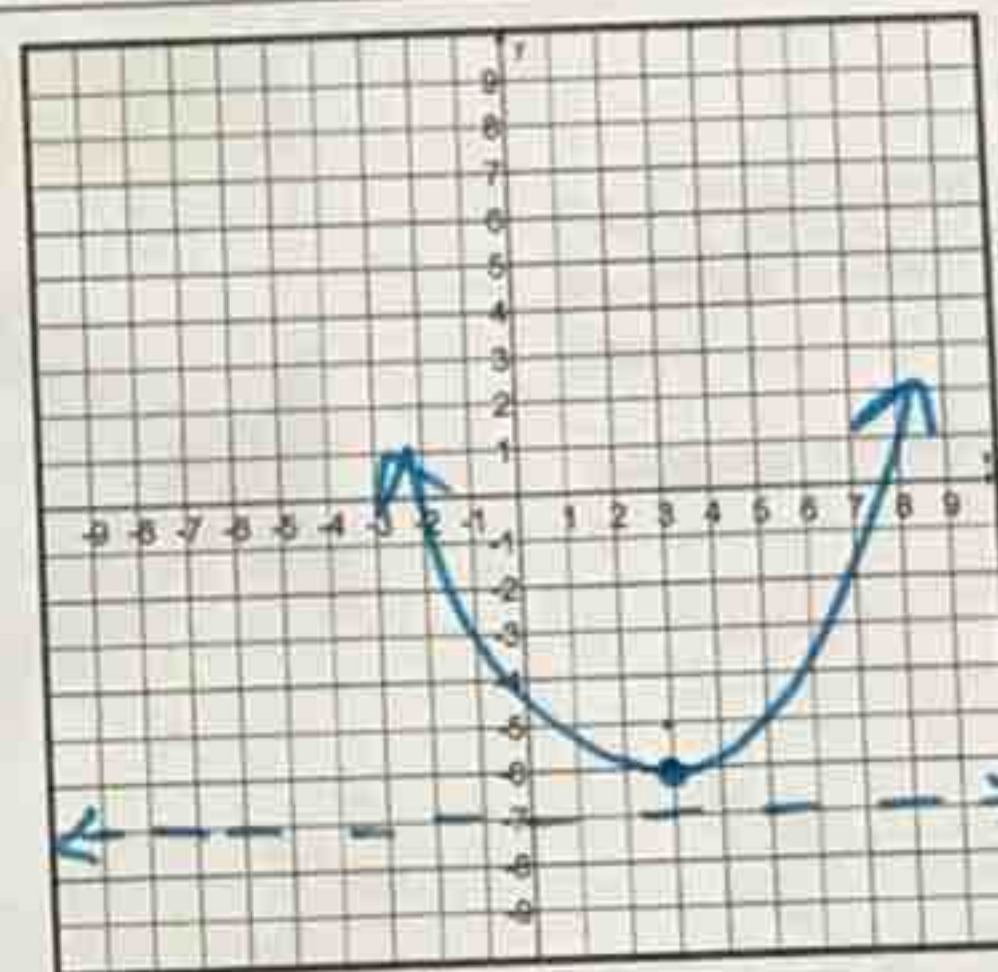
3. $(y-1)^2 = 4(x+3)$

Vertex: $(-3, 1)$
 Value of c : 1
 Focus: $(-2, 1)$
 Directrix: $x = -4$
 Axis of Symmetry: $y = 1$
 Domain: $[-3, \infty)$
 Range: $(-\infty, \infty)$



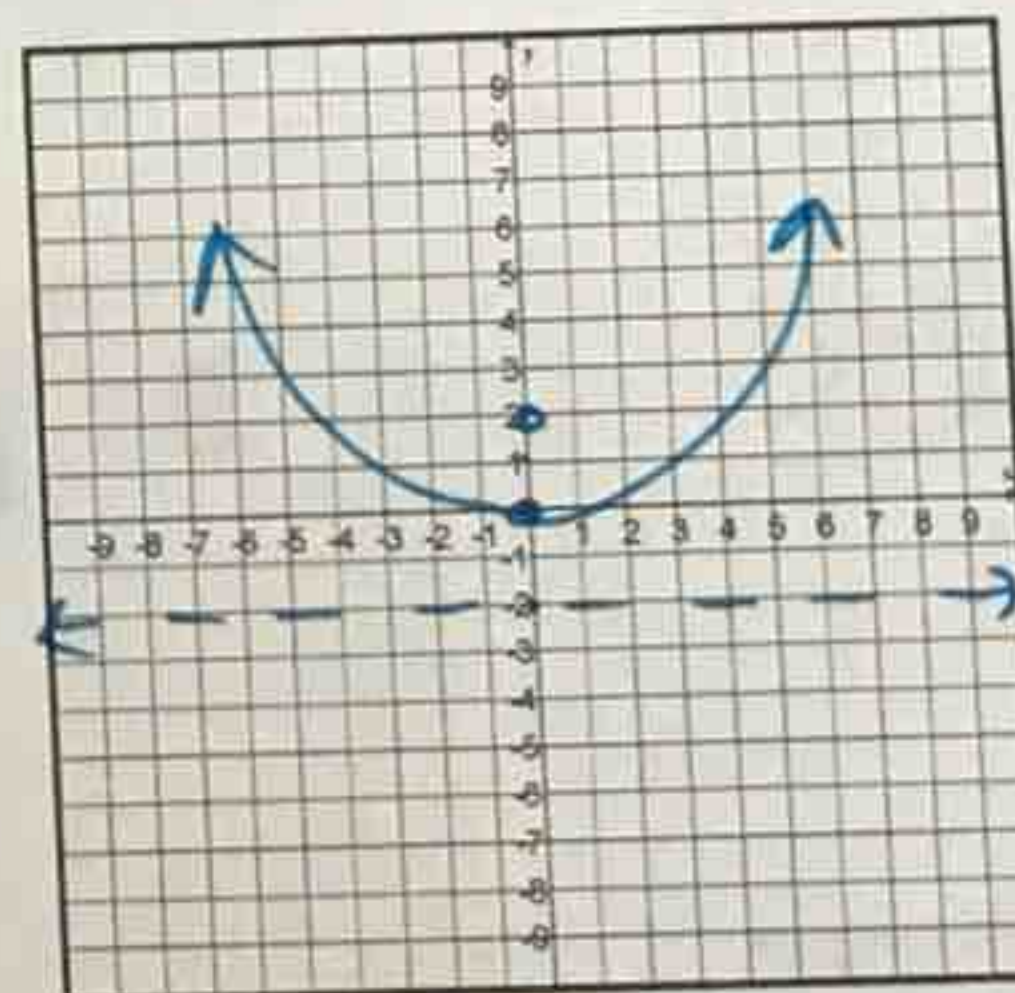
4. $(x-3)^2 = 4(y+6)$ up

Vertex: $(3, -6)$
 Value of c : 1
 Focus: $(3, -5)$
 Directrix: $y = -7$
 Axis of Symmetry: $x = 3$
 Domain: $(-\infty, \infty)$
 Range: $[-6, \infty)$



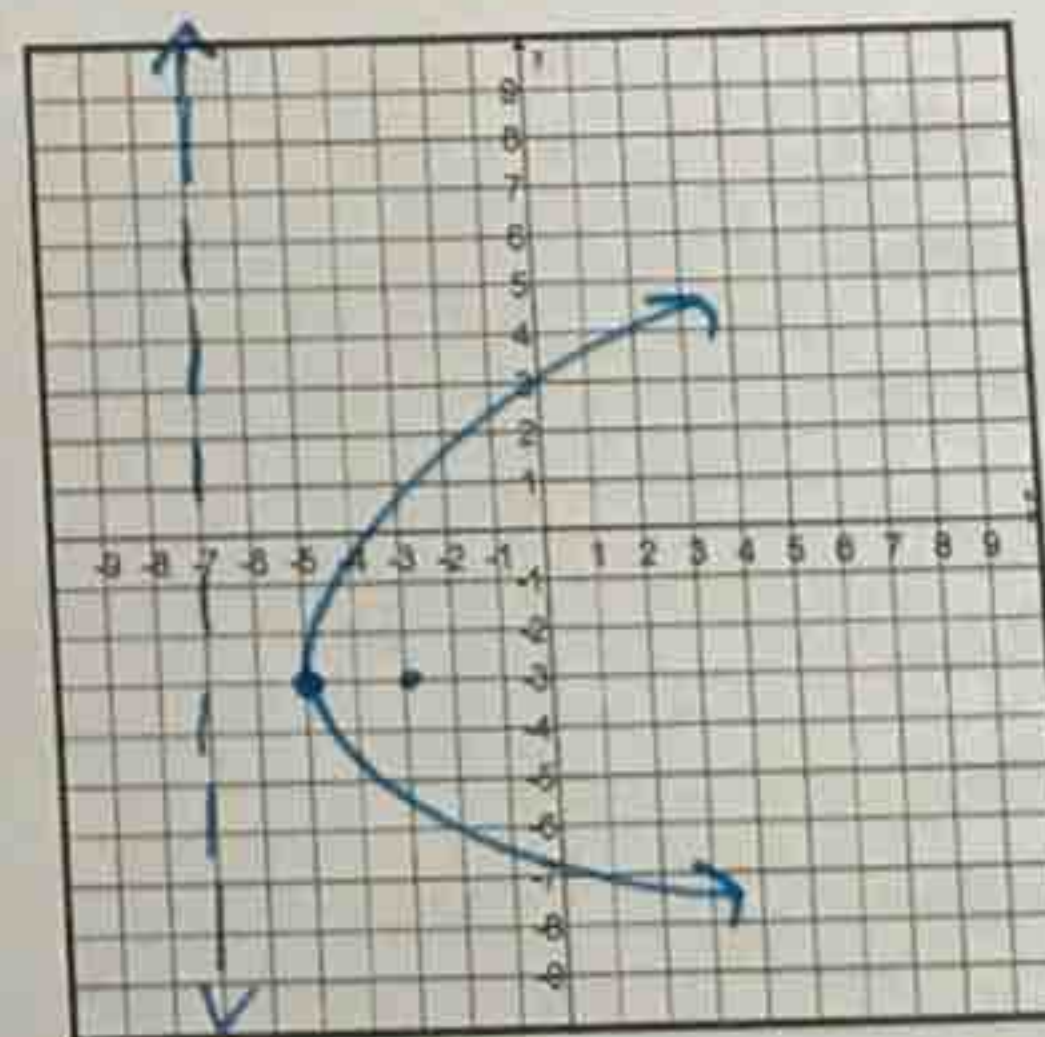
5. $y - \frac{1}{8}x^2 = 0$ $y = \frac{1}{8}x^2$ up
 $8y = x^2$ up

Vertex: $(0, 0)$
 Value of c : 2
 Focus: $(0, 2)$
 Directrix: $y = -2$
 Axis of Symmetry: $x = 0$
 Domain: $(-\infty, \infty)$
 Range: $[0, \infty)$



6. $\frac{1}{8}(y+3)^2 - 5 = x$

Vertex: $(-5, -3)$
 Value of c : 2
 Focus: $(-3, -3)$
 Directrix: $x = -7$
 Axis of Symmetry: $y = -3$
 Domain: $[-5, \infty)$
 Range: $(-\infty, \infty)$



7. The graph of $x = y^2$ is stretched by a scale factor of 4, translated right 6 units and down 3 units. Write the equation to represent the image of the graph after the translation in standard form.

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

8. Given the equation $(x-3)^2 = \frac{1}{8}(y-2)$, write the equation if it is reflected over the x-axis and translated up 3 units and translated left 2 units.

$$(x-1)^2 = -\frac{1}{8}(y-5)$$

9. Determine the following conic section line(s) of symmetry. $(x-4) = (y+5)^2$

A $x = 4$ only
 B $y = -5$ only
 C $x = 4, y = -5$
 D Infinite lines of symmetry

10. Parabolas have which of the following characteristics?

☒ I. Exactly 1 line of symmetry
☒ II. Exactly 2 lines of symmetry
☒ III. Created by the intersection of a cone and plane parallel to its base.
☒ IV. Created by the intersection of a cone and a plane perpendicular to its base.

A I and III
 B II and III
 C I and IV
 D II and IV