

1. Find all values of y so that the distance between the points $(4, y)$ and $(0, 2)$ is $4\sqrt{2}$.

#2-5: Graph the parabolas by plotting at least 3 points. Find and locate vertex, axis of symmetry, focus, and directrix.

2. $y = \frac{1}{2}(x-3)^2$ 3. $x = -2(y-2)^2 + 3$ 4. $y = -(x+1)^2 + 3$ 5. $x = \frac{1}{4}y^2 + 1$

#6-9: Use completing the square to rewrite each parabola equation in vertex form. Graph the parabolas by plotting at least 3 points. Find and locate vertex, axis of symmetry, focus, and directrix.

6. $4y = x^2 - 4x$ 7. $8x - 20 = y^2 - 4y$ 8. $x^2 - 6x + 8y - 7 = 0$

9. $y^2 + 8y + 12x + 4 = 0$

#10-12: Find the equation of a parabola in vertex form, using the given information. (hint: a sketch may be helpful)

10. vertex $(2, -3)$, focus $(2, -1)$

11. vertex $(5, 2)$, directrix $y = \frac{3}{2}$

12. focus $(-1, 5)$, directrix $x = -3$

Answers: 1. 6 or -2 2. $V(3, 0)$; axis $x = 3$; $F\left(3, \frac{1}{2}\right)$; d: $y = \frac{-1}{2}$

3. $V(3, 2)$; axis $y = 2$; $F\left(2\frac{7}{8}, 2\right)$; d: $x = 3\frac{1}{8}$ 4. $V(-1, 3)$; axis $x = -1$; $F\left(-1, 2\frac{3}{4}\right)$;

d: $y = 3\frac{1}{4}$ 5. $V(1, 0)$; axis $y = 0$; $F(2, 0)$; directrix $x = 0$ 6. $y = \frac{1}{4}(x-2)^2 - 1$;

$V(2, -1)$; axis $x = 2$; $F(2, 0)$; d: $y = -2$ 7. $x = \frac{1}{8}(y-2)^2 + 2$; $V(2, 2)$; axis $y = 2$; $F(4, 2)$;

d: $x = 0$ 8. $y = \frac{-1}{8}(x-3)^2 + 2$; $V(3, 2)$; axis $x = 3$; $F(3, 0)$; d: $y = 4$

9. $x = \frac{-1}{12}(y+4)^2 + 1$; $V(1, -4)$; axis $y = -4$; $F(-2, -4)$; d: $x = 4$ 10. $y = \frac{1}{8}(x-2)^2 - 3$

11. $y = \frac{1}{2}(x-5)^2 + 2$ 12. $x = \frac{1}{4}(y-5)^2 - 1$