

1. Focus: $(\frac{1}{2}, 0)$; Directrix: $x = -\frac{1}{2}$; Focal diameter: 2
2. Vertices: $(0, \pm 3)$; Foci: $(0, \pm\sqrt{5})$; Major axis length: 6; Minor axis length: 4; Eccentricity: $\frac{\sqrt{5}}{3}$
3. Hyperbola. Center: $(5, 5)$; Foci: $(5 \pm \sqrt{2}, 5)$; Vertices: $(4, 5)$ and $(6, 5)$; Asymptotes: $y = x$ and $y = -x + 10$
4. $\frac{x^2}{36} + \frac{y^2}{11} = 1$
5. $\frac{y^2}{36} - \frac{x^2}{324} = 1$
6.
 - a) Parabola. Vertex: $(0, 0)$; Focus: $(0, 1)$; Directrix: $y = -1$; Focal diameter: 4 (Note: $x^2 = 4y$)
 - b) Parabola. Vertex: $(0, 0)$; Focus: $(-\frac{1}{6}, 0)$; Directrix: $x = \frac{1}{6}$; Focal diameter: $\frac{2}{3}$ (Note: $y^2 = -\frac{2}{3}x$)
 - c) Parabola. Vertex: $(1, 0)$; Focus: $(1, -\frac{3}{2})$; Directrix: $y = \frac{3}{2}$; Focal diameter: 6 (Note: $(x - 1)^2 = -6y$)
 - d) Parabola. Vertex: $(1, -2)$; Focus: $(3, -2)$; Directrix: $x = -1$; Focal diameter: 8 (Note: $(y + 2)^2 = 8(x - 1)$)
 - e) Ellipse. Center: $(0, 0)$; Foci: $(\pm 2, 0)$; Vertices: $(\pm 3, 0)$; Major axis length: 6; Minor axis length: $2\sqrt{5}$; Eccentricity: $\frac{2}{3}$ (Note: $\frac{x^2}{9} + \frac{y^2}{5} = 1$)
 - f) Ellipse. Center: $(0, 0)$; Foci: $(0, \pm\sqrt{\frac{7}{2}})$; Vertices: $(0, \pm 2)$; Major axis length: 4; Minor axis length: $\frac{2}{\sqrt{2}}$; Eccentricity: $\frac{\sqrt{7}}{2\sqrt{2}}$ (Note: $\frac{x^2}{(\frac{1}{2})} + \frac{y^2}{4} = 1$)
 - g) Ellipse. Center: $(1, -3)$; Foci: $(1, -3 \pm \sqrt{3})$; Vertices: $(1, -1)$ and $(1, -5)$; Major axis length: 4; Minor axis length: 2; Eccentricity: $\frac{\sqrt{3}}{2}$ (Note: $\frac{(x-1)^2}{1} + \frac{(y+3)^2}{4} = 1$)
 - h) Ellipse. Center: $(-3, 2)$; Foci: $(-3 \pm 2\sqrt{3}, 2)$; Vertices: $(1, 2)$ and $(-7, 2)$; Major axis length: 8; Minor axis length: 4; Eccentricity: $\frac{\sqrt{3}}{2}$ (Note: $\frac{(x+3)^2}{16} + \frac{(y-2)^2}{4} = 1$)
 - i) Hyperbola. Center: $(0, 0)$; Foci: $(\pm\frac{\sqrt{37}}{2}, 0)$; Vertices: $(\pm 3, 0)$; Asymptotes: $y = \pm\frac{1}{6}x$ (Note: $\frac{x^2}{9} - \frac{y^2}{(\frac{1}{4})} = 1$)
 - j) Hyperbola. Center: $(0, 0)$; Foci: $(0, \pm\sqrt{6})$; Vertices: $(0, \pm 2)$; Asymptotes: $y = \pm\frac{2}{\sqrt{2}}x$ (Note: $\frac{y^2}{4} - \frac{x^2}{2} = 1$)
 - k) Hyperbola. Center: $(-2, -1)$; Foci: $(-2, -1 \pm \sqrt{10})$; Vertices: $(-2, 0)$ and $(-2, -2)$; Asymptotes: $y + 1 = \pm\frac{1}{3}(x + 2)$ (Note: $\frac{(y+1)^2}{1} - \frac{(x+2)^2}{9} = 1$)
 - l) Hyperbola. Center: $(3, 0)$; Foci: $(3 \pm \sqrt{29}, 0)$; Vertices: $(5, 0)$ and $(1, 0)$; Asymptotes: $y = \pm\frac{5}{2}(x - 3)$ (Note: $\frac{(x-3)^2}{4} - \frac{y^2}{25} = 1$)

$$7. (y - 1)^2 = -6\left(x + \frac{1}{2}\right)$$

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

$$9. \frac{x^2}{3} + \frac{y^2}{4} = 1$$

$$10. \frac{(x+1)^2}{9} + \frac{(y-2)^2}{5} = 1$$

$$11. \frac{x^2}{9} - \frac{4y^2}{9} = 1$$

$$12. \frac{(y-2)^2}{9} - \frac{(x+2)^2}{4} = 1$$