

Part B: ANSWERS

1. $4x^2 + 4y^2 = 9$ Circle

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

Center: $(0, 0)$ $r = \frac{3}{2}$

2. $4x^2 + 3y^2 = 24$ Ellipse

$$\frac{x^2}{6} + \frac{y^2}{8} = 1$$

Center: $(0, 0)$

Vertices: $(0, \pm 2\sqrt{2})$

Foci: $(0, \pm\sqrt{2})$

3. $y^2 - 6x^2 = 12$ Hyperbola

$$\frac{y^2}{12} - \frac{x^2}{2} = 1$$

Center: $(0, 0)$

Vertices: $(0, \pm 2\sqrt{3})$

Foci: $(0, \pm\sqrt{14})$

Asymptotes: $y = \pm\sqrt{6}x$

4. $x^2 - 10y = 0$ Parabola

$$x^2 = 10y$$

Vertex: $(0, 0)$

Focus: $\left(0, \frac{5}{2}\right)$

Directrix: $y = -\frac{5}{2}$

5. $4(x-11)^2 - 5(y-17)^2 = 100$

Hyperbola

$$\frac{(x-11)^2}{25} - \frac{(y-17)^2}{20} = 1$$

Center: $(11, 17)$

Vertices: $(16, 17), (6, 17)$

Foci: $(11 \pm 3\sqrt{5}, 17)$

Asymptotes:

$$y - 17 = \pm \frac{2\sqrt{5}}{5}(x - 11)$$

6. $27(x+1)^2 + 2(y-10)^2 = 54$

Ellipse

$$\frac{(x+1)^2}{2} + \frac{(y-10)^2}{27} = 1$$

Center: $(-1, 10)$

Vertices: $(-1, 10 \pm 3\sqrt{3})$

Foci: $(-1, 15), (-1, 5)$

7. $3y^2 + 11x = 0$ Parabola

$$y^2 = -\frac{11}{3}x$$

Vertex: $(0, 0)$

Focus: $\left(-\frac{11}{12}, 0\right)$

Directrix: $x = \frac{11}{12}$

8. $3(x-5)^2 + 3(y-11)^2 = 6$

Circle

$$(x-5)^2 + (y-11)^2 = 2$$

Center: $(5, 11)$ $r = \sqrt{2}$

9. $16x^2 - 9y^2 - 64x - 18y - 89 = 0$

Hyperbola

$$\frac{(x-2)^2}{9} - \frac{(y+1)^2}{16} = 1$$

Center: (2, -1)

Vertices: (-1, -1), (5, -1)

Foci: (-3, -1), (7, -1)

Asymptotes: $y + 1 = \pm \frac{4}{3}(x - 2)$

10. $x^2 + 4x = -2y$

Parabola

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

Vertex: (-2, 2)

Focus: $\left(-2, \frac{3}{2}\right)$

Directrix: $y = \frac{5}{2}$

11. $x^2 + y^2 + 40x + 6y + 359 = 0$

Circle

$$(x + 20)^2 + (y + 3)^2 = 50$$

Center: (-20, -3) $r = 5\sqrt{2}$

12. $2x^2 + 3y^2 - 8x + 6y + 5 = 0$

Ellipse

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

Center: (2, -1)

Vertices: $(2 \pm \sqrt{3}, -1)$

Foci: (3, -1), (1, -1)

13. $4x^2 + 9y^2 - 16x - 18y = 11$

Ellipse

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

Center: (2, 1)

Vertices: (5, 1), (-1, 1)

Foci: $(2 \pm \sqrt{5}, 1)$

14. $(y - 3)^2 = 8x + 20$

Parabola

$$(y - 3)^2 = 8\left(x + \frac{5}{2}\right)$$

Vertex: $\left(-\frac{5}{2}, 3\right)$ Focus: $\left(-\frac{1}{2}, 3\right)$

Directrix: $x = -\frac{9}{2}$

15. $x^2 - 8y^2 - 8x + 80y - 176 = 0$

Hyperbola

$$\frac{(y-5)^2}{1} - \frac{(x-4)^2}{8} = 1$$

Center: (4, 5)

Vertices: (4, 4), (4, 6)

Foci: (4, 8) & (4, 2)

Asymptotes: $y - 5 = \pm \frac{\sqrt{2}}{4}(x - 4)$

16. $2x^2 + 2y^2 - 12x + 8y - 37 = 0$

Circle

$$(x - 3)^2 + (y + 2)^2 = \frac{63}{2}$$

Center: (3, -2) $r = \frac{3\sqrt{7}}{\sqrt{2}}$ or $\frac{3\sqrt{14}}{2}$