

## SBM 2 Review

Date \_\_\_\_\_

**Identify the vertices, foci, and asymptotes of each.**

$$1) \frac{(y-2)^2}{121} - \frac{(x+3)^2}{16} = 1$$

Vertices:  $(-3, 13), (-3, -9)$   
 Foci:  $(-3, 2 + \sqrt{137}), (-3, 2 - \sqrt{137})$   
 Asym.:  $y = \frac{11}{4}x + \frac{41}{4}$   
 $y = -\frac{11}{4}x - \frac{25}{4}$

**Identify the center, vertices, co-vertices, foci, length of the major axis, and length of the minor axis of each.**

$$2) \frac{(x-10)^2}{144} + \frac{(y+5)^2}{196} = 1$$

Center:  $(10, -5)$   
 Vertices:  $(10, 9), (10, -19)$   
 Co-vertices:  $(22, -5), (-2, -5)$   
 Foci:  $(10, -5 + 2\sqrt{13}), (10, -5 - 2\sqrt{13})$   
 Major Axis: 28 units  
 Minor Axis: 24 units

**Identify the vertex, focus, axis of symmetry, and directrix of each.**

$$3) y = 7(x+9)^2 + 3$$

Vertex:  $(-9, 3)$   
 Focus:  $(-9, \frac{85}{28})$   
 Axis of Sym.:  $x = -9$   
 Directrix:  $y = \frac{83}{28}$

**Identify the center and radius of each.**

$$4) (x-5)^2 + (y+11)^2 = 24$$

Center:  $(5, -11)$   
 Radius:  $2\sqrt{6}$

**Identify the conic and write the standard form equation of each.**

$$5) x^2 + 4y^2 - 14x + 40y + 5 = 0$$

$$\frac{(x-7)^2}{144} + \frac{(y+5)^2}{36} = 1$$

$$6) x^2 + y^2 + 30x - 20y + 316 = 0$$

$$(x+15)^2 + (y-10)^2 = 9$$

$$7) x^2 - 4y^2 + 12x - 16y - 80 = 0$$

$$\frac{(x+6)^2}{100} - \frac{(y+2)^2}{25} = 1$$

$$8) -3y^2 + x + 42y - 154 = 0$$

$$x = 3(y-7)^2 + 7$$

Use the information provided to write the standard form equation of each circle.

$$9) \text{ Center: } (-1, -4)$$

$$\text{Radius: } \sqrt{95}$$

$$(x+1)^2 + (y+4)^2 = 95$$

Use the information provided to write the vertex form equation of each parabola.

$$10) \text{ Vertex: } (5, -6), \text{ Focus: } (5, -5)$$

$$y = \frac{1}{4}(x-5)^2 - 6$$

$$11) \text{ Focus: } \left(-\frac{49}{8}, 7\right), \text{ Directrix: } x = -\frac{47}{8}$$

$$x = -2(y-7)^2 - 6$$

Use the information provided to write the standard form equation of each ellipse.

$$12) \text{ Vertices: } (9, 4), (-13, 4)$$

$$\text{Co-vertices: } (-2, 12), (-2, -4)$$

$$\frac{(x+2)^2}{121} + \frac{(y-4)^2}{64} = 1$$

$$13) \text{ Foci: } (-8, -4 + 5\sqrt{3}), (-8, -4 - 5\sqrt{3})$$

$$\text{Co-vertices: } (3, -4), (-19, -4)$$

$$\frac{(x+8)^2}{121} + \frac{(y+4)^2}{196} = 1$$

Use the information provided to write the standard form equation of each hyperbola.

$$14) \text{ Vertices: } (10, 11), (10, -7)$$

$$\text{Foci: } (10, 2 + \sqrt{202}), (10, 2 - \sqrt{202})$$

$$\frac{(y-2)^2}{81} - \frac{(x-10)^2}{121} = 1$$

$$15) \text{ Vertices: } (2, 9), (-8, 9)$$

$$\text{Perimeter of Central Rectangle} = 44$$

$$\frac{(x+3)^2}{25} - \frac{(y-9)^2}{36} = 1$$

Identify the vertices, foci, and asymptotes of each.

$$16) \frac{(x+7)^2}{196} - \frac{(y-9)^2}{49} = 1$$

Vertices:  $(7, 9), (-21, 9)$   
 Foci:  $(-7 + 7\sqrt{5}, 9), (-7 - 7\sqrt{5}, 9)$   
 Asym.:  $y = \frac{1}{2}x + \frac{25}{2}$   
 $y = -\frac{1}{2}x + \frac{11}{2}$