

10BC

Circles & Ellipses

Skills Check Review

Ellipse/Circle Review: a) write the equation b) state all critical info c) sketch, stating domain and range

1. Circle:
 Center (-5, 3)
 Radius = $4\sqrt{3}$

$$(x+5)^2 + (y-3)^2 = 48$$

$$x \in [-5-4\sqrt{3}, -5+4\sqrt{3}]$$

$$y \in [3-4\sqrt{3}, 3+4\sqrt{3}]$$

2. Circle:
 Center (7, -3)
 Point (2, 4)

$$r = \sqrt{5^2 + 7^2} = \sqrt{74}$$

$$(x-7)^2 + (y+3)^2 = 74$$

$$x \in [7-\sqrt{74}, 7+\sqrt{74}]$$

$$y \in [-3-\sqrt{74}, -3+\sqrt{74}]$$

3. Circle:
 End points diameter
 (0, -5) and (2, -7)

$$C: (1, -6) \quad r = \sqrt{1^2 + 1^2} = \sqrt{2}$$

$$(x-1)^2 + (y+6)^2 = 2$$

$$x \in [1-\sqrt{2}, 1+\sqrt{2}]$$

$$y \in [-6-\sqrt{2}, -6+\sqrt{2}]$$

4. Ellipse: $a=4 \quad c=2$
 Center (-1, 2)
 Focus: (-3, 2), Vertex (-5, 2)

$$b^2 = a^2 - c^2 = 16 - 4 = 12$$

$$b = \sqrt{12} = 2\sqrt{3}$$

$$\frac{(x+1)^2}{16} + \frac{(y-2)^2}{12} = 1$$

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

$$x \in [-5, 3]$$

$$y \in [2-2\sqrt{3}, 2+2\sqrt{3}]$$

- * Two options!
 5. Ellipse @ origin:
 Major Axis Length: 10
 Minor Axis Length: 6

$$a=5, \quad b=3, \quad c=4$$

Horizontal:

$$\frac{x^2}{25} + \frac{y^2}{9} = 1$$

Vertical:

$$\frac{x^2}{9} + \frac{y^2}{25} = 1$$

V: $(\pm 5, 0)$
 CV: $(0, \pm 3)$
 F: $(\pm 4, 0)$

V: $(0, \pm 5)$
 CV: $(\pm 3, 0)$
 F: $(0, \pm 4)$

6. Ellipse: $a=2$
 Foci: (-1, 0) (1, 0)
 Major Axis Length: 4
 center: (0, 0)

$$b^2 = a^2 - c^2 = 4 - 1 = 3$$

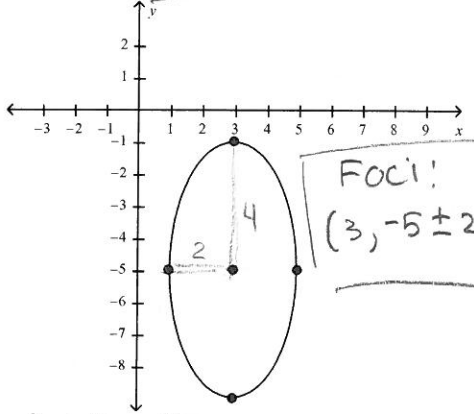
$$\frac{x^2}{4} + \frac{y^2}{3} = 1$$

$$x \in [-2, 2]$$

$$y \in [-\sqrt{3}, \sqrt{3}]$$

For the following graphs, write the equation of the graphs, and state the foci

7. $\frac{(x-3)^2}{12} + \frac{(y+5)^2}{16} = 1$



Foci: $(3, -5 \pm 2\sqrt{3})$

$$a^2 - b^2 = c^2$$

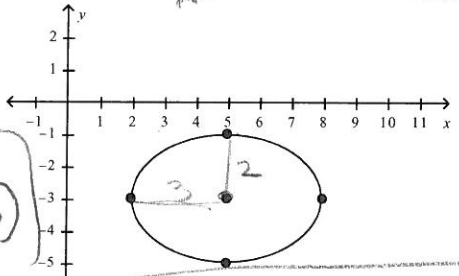
$$16 - 4 = c^2$$

$$c = \sqrt{12} = 2\sqrt{3}$$

$$a - 4 = 5$$

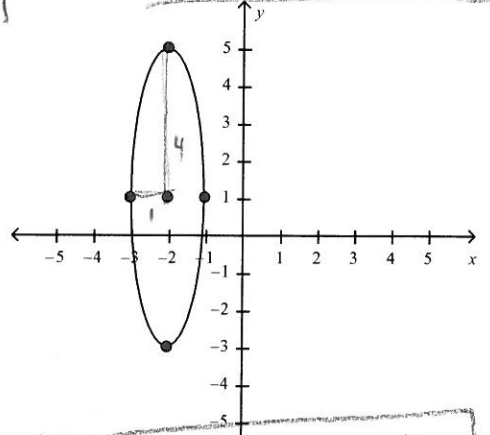
$$c = \sqrt{5}$$

8. $\frac{(x-5)^2}{9} + \frac{(y+3)^2}{4} = 1$



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

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



Foci: $(-2, 1 \pm \sqrt{15})$