

Graphing and Properties of Ellipses

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

Name _____ Date _____ Period _____

1) $\frac{x^2}{49} + \frac{y^2}{169} = 1$

Center: (0, 0)
 Vertices: (0, 13), (0, -13)
 Co-vertices: (7, 0), (-7, 0)
 Foci: (0, 2√30), (0, -2√30)
 Major Axis: 26 units
 Minor Axis: 14 units

3) $\frac{x^2}{95} + \frac{y^2}{30} = 1$

Center: (0, 0)
 Vertices: (√95, 0), (-√95, 0)
 Co-vertices: (0, √30), (0, -√30)
 Foci: (√65, 0), (-√65, 0)
 Major Axis: 2√95 units
 Minor Axis: 2√30 units

2) $\frac{x^2}{36} + \frac{y^2}{16} = 1$

Center: (0, 0)
 Vertices: (6, 0), (-6, 0)
 Co-vertices: (0, 4), (0, -4)
 Foci: (2√5, 0), (-2√5, 0)
 Major Axis: 12 units
 Minor Axis: 8 units

4) $\frac{x^2}{169} + \frac{y^2}{64} = 1$

Center: (0, 0)
 Vertices: (13, 0), (-13, 0)
 Co-vertices: (0, 8), (0, -8)
 Foci: (√105, 0), (-√105, 0)
 Major Axis: 26 units
 Minor Axis: 16 units

5) $\frac{x^2}{64} + \frac{(y-6)^2}{121} = 1$

Center: (0, 6)
 Vertices: (0, 17), (0, -5)
 Co-vertices: (8, 6), (-8, 6)
 Foci: (0, 6 + √57), (0, 6 - √57)
 Major Axis: 22 units
 Minor Axis: 16 units

6) $\frac{(x+5)^2}{81} + \frac{(y-1)^2}{144} = 1$

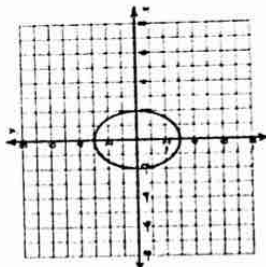
Center: (-5, 1)
 Vertices: (-5, 13), (-5, -11)
 Co-vertices: (4, 1), (-14, 1)
 Foci: (-5, 1 + 3√7), (-5, 1 - 3√7)
 Major Axis: 24 units
 Minor Axis: 18 units

7) $\frac{(x-3)^2}{49} + \frac{(y-9)^2}{4} = 1$

Center: (3, 9)
 Vertices: (10, 9), (-4, 9)
 Co-vertices: (3, 11), (3, 7)
 Foci: (3 + 3√5, 9), (3 - 3√5, 9)
 Major Axis: 14 units
 Minor Axis: 4 units

Graph each equation.

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



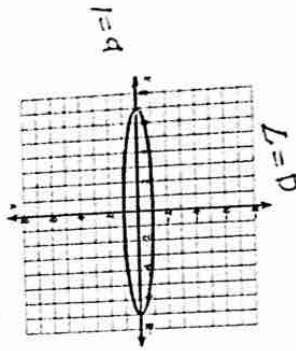
a=3

b=2

8) $\frac{x^2}{64} + \frac{(y-8)^2}{9} = 1$

Center: (0, 8)
 Vertices: (8, 8), (-8, 8)
 Co-vertices: (0, 11), (0, 5)
 Foci: (√55, 8), (-√55, 8)
 Major Axis: 16 units
 Minor Axis: 6 units

10) $\frac{x^2}{49} + y^2 = 1$



b=1

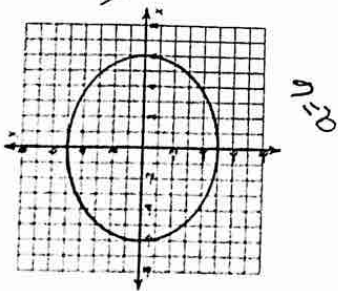
a=7

Answer

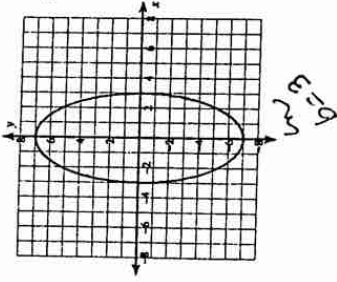
Key

Day 4 WS-answers

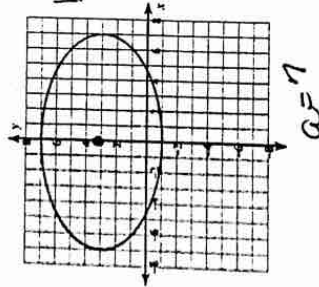
11) $\frac{x^2}{36} + \frac{y^2}{25} = 1$



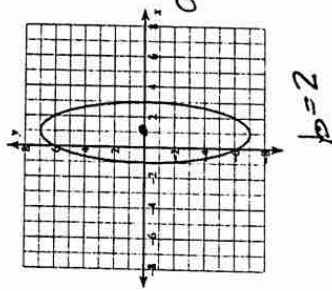
12) $\frac{x^2}{9} + \frac{y^2}{49} = 1$



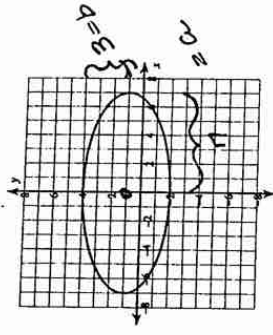
13) $\frac{x^2}{49} + \frac{(y-3)^2}{16} = 1$



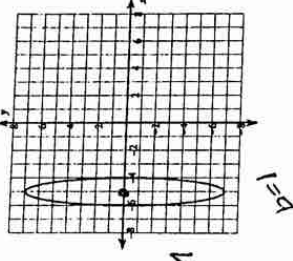
14) $\frac{(x-1)^2}{4} + \frac{y^2}{49} = 1$



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



16) $(x+5)^2 + \frac{y^2}{49} = 1$



#17) $c^2 = (4\sqrt{5})^2 - 2(\sqrt{10})^2$
 $c^2 = 16 \cdot 5 - 2 \cdot 10$
 $c^2 = 80 - 20$
 $c^2 = 60$
 $c = \sqrt{60} = 2\sqrt{15}$
 $e = \frac{2\sqrt{15}}{4\sqrt{5}} = \frac{\sqrt{15}}{2} \approx 0.707$

#18) $c^2 = 169 - 4$
 $c^2 = 165$
 $c = \sqrt{165}$
 $e = \frac{\sqrt{165}}{13} \approx 0.988$

Identify the length of the major axis, length of the minor axis, length of the latus rectum, and eccentricity of each.

17) $-16y + 52 = -2x^2 - 8x - y^2$

Major Axis: $4\sqrt{5}$ units
 Minor Axis: $2\sqrt{10}$ units
 Latus Rectum: $2\sqrt{5}$ units
 Eccentricity: $\frac{\sqrt{2}}{2} = 0.707$

18) $4y^2 - 338x + 32y = -169x^2 + 443$

Major Axis: 26 units
 Minor Axis: 4 units
 Latus Rectum: $\frac{8}{13}$ units
 Eccentricity: $\frac{\sqrt{165}}{13} = 0.988$

19) $\frac{(x+4)^2}{4} + \frac{(y+9)^2}{64} = 1$

Major Axis: 16 units
 Minor Axis: 4 units
 Latus Rectum: 1 unit
 Eccentricity: $\frac{\sqrt{15}}{4} = 0.968$

20) $126y + 9y^2 - 8x - 131 = -4x^2$

Major Axis: 24 units
 Minor Axis: 16 units
 Latus Rectum: $\frac{32}{3}$ units
 Eccentricity: $\frac{\sqrt{5}}{3} = 0.745$

ellipse
 $e = \frac{\sqrt{a^2 - b^2}}{a} = \frac{c}{a}$

$4\sqrt{5}$