AOS Math 10 Conic Sections Test

February 2, 2024

Name and block: _____

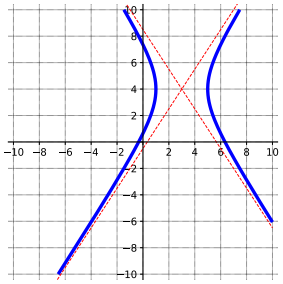
True / False

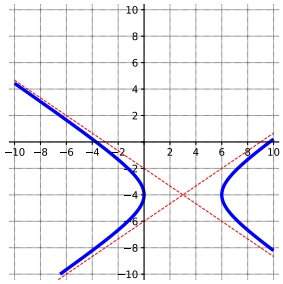
1. (1 point) _____ The major axis of a (non-circular) ellipse is always longer than the minor axis.
2. (1 point) _____ The transverse axis of a hyperbola is always longer than the conjugate axis.
3. (1 point) _____ The foci of an ellipse are on the minor axis.
4. (1 point) _____ The focus of the parabola $x^2 = 8y$ is the lowest point on the parabola.
5. (1 point) _____ The graph of $\frac{x^2}{16} + \frac{y^2}{25} = 1$ fits entirely inside the graph of $x^2 + y^2 = 30$
6. (1 point) _____ The directrix of a parabola is perpendicular to the axis of symmetry.
7. (1 point) _____ The distance between two foci of an ellipse is $2c$.
8. (1 point) _____ The eccentricity of an ellipse can be $e = 1.14$.
9. (1 point) _____ A circle is an ellipse with $a = b$.
10. (1 point) _____ The graphs of $\frac{x^2}{2} - \frac{y^2}{3} = 1$ and $\frac{y^2}{2} - \frac{x^2}{3} = 1$ have the same asymptotes.

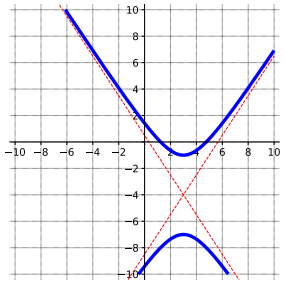
Multiple Choice

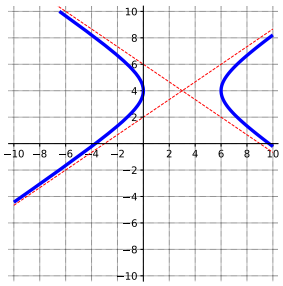
Work must be shown for credit

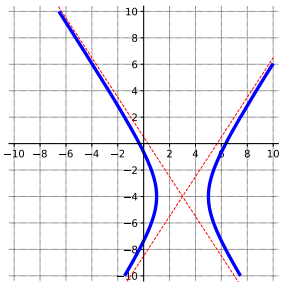
1. (3 points) **Note the scale is 2 below.** Which is the graph of $\frac{(x-3)^2}{9} - \frac{(y+4)^2}{4}$?

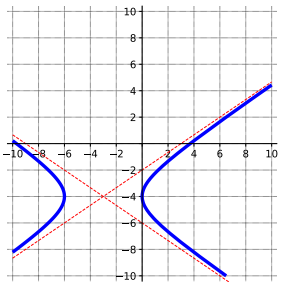
A. 

B. 

C. 

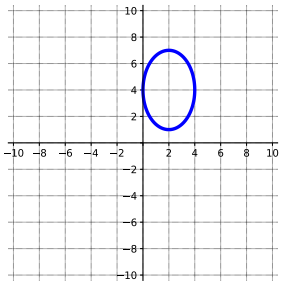
D. 

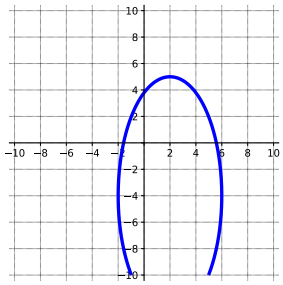
E. 

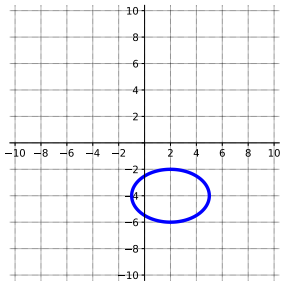
F. 

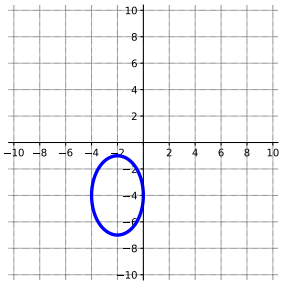
1. _____

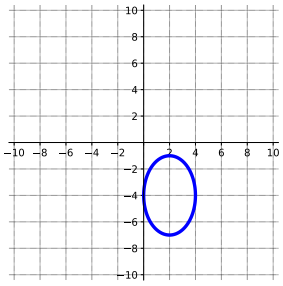
2. (3 points) **Note the scale is 2 below.** Which is the graph of $\frac{(x-2)^2}{4} + \frac{(y+4)^2}{9}$?

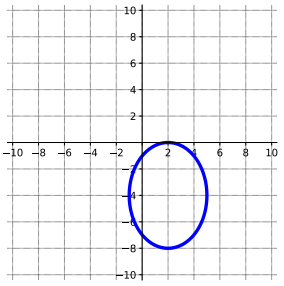
A. 

B. 

C. 

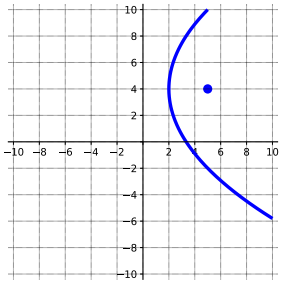
D. 

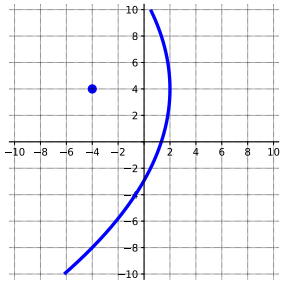
E. 

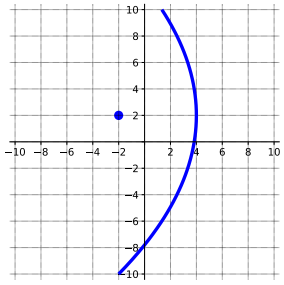
F. 

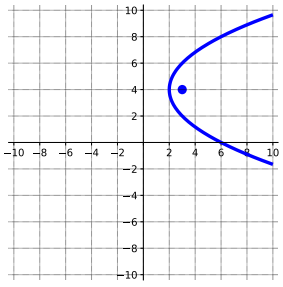
2. _____

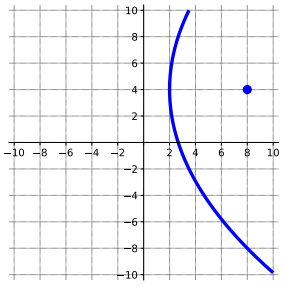
3. (3 points) **Note the scale is 2 below.** Which is the graph of $(y-4)^2 = 12(x-2)$?

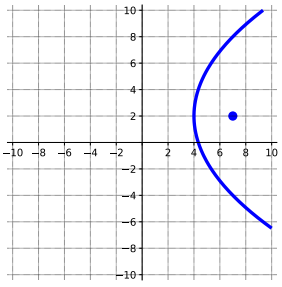
A. 

B. 

C. 

D. 

E. 

F. 

3. _____

4. (3 points) What are the foci of the hyperbola $\dfrac{x^2}{16} - \dfrac{y^2}{12} = 1$?

A. $(0, \pm 2)$

B. $(0, \pm 2\sqrt{7})$

C. $(\pm 2\sqrt{7}, 0)$

D. $(\pm 2, 0)$

4. _____

5. (3 points) Which is **not** a vertex or co-vertex of the ellipse $\dfrac{x^2}{9} + \dfrac{(y-2)^2}{7} = 1$

A. $(0, 2-\sqrt{7})$

B. $(3, \sqrt{7})$

C. $(-3, 2)$

D. $(3, 2)$

5. _____

6. (3 points) What is the equation of a parabola with

   - a vertex at $(3, -2)$
   - a horizontal axis of symmetry
   - the parabola passes through the point $(0, 1)$

   A. $(x+3)^2 = 12(y+2)$

   B. $(x-3)^2 = 12(y-2)$

   C. $(x-3)^2 = 3(y+2)$

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

   E. $(x-3)^2 = 4(y+2)$

6. _____

7. (3 points) Write the equation of the ellipse that has a major axis 28 units long and is parallel to the y axis, a minor axis 26 units long, and a center at $(11, 8)$.

   A. $\dfrac{(x+11)^2}{196} + \dfrac{(y+8)^2}{169} = 1$

   B. $\dfrac{(x-11)^2}{196} + \dfrac{(y-8)^2}{169} = 1$

   C. $\dfrac{(x+11)^2}{169} + \dfrac{(y+8)^2}{196} = 1$

   D. $\dfrac{(x-11)^2}{169} + \dfrac{(y-8)^2}{196} = 1$

7. _____

8. (3 points) Given the equation of a circle in standard form: $(x+3)^2+(y-4)^2=49$. Write the equation in general form.

   A. $x^2+y^2-24=0$

   B. $x^2+y^2+6x-8y-24=0$

   C. $x^2+y^2-+3x-4y-24=0$

   D. $x^2+y^2+74=0$

   E. $x^2+y^2+6x-8y+74=0$

8. _____