Determine whether the series below converges or diverges.
For convergent series, find the sum of the series.

$$\sum_{k=1}^{\infty} \frac{40}{k(k+2)}$$

Determine if the following sequence converges to zero.

$$\left\{ \frac{4}{n^2} \right\}_{n=1}^{\infty}$$

Determine the radius and interval of convergence for the power series

$$\sum_{k=0}^{\infty} \frac{4^k}{k!}(x-5)^k.$$

Determine the convergence or divergence of the series.

$$\sum_{k=1}^{\infty} \frac{4k^2}{k^{5/2}+3}$$

True or false?

$$\sum_{k=0}^{\infty} (-1)^k 2^k \text{ diverges.}$$

Use the method of partial sums to estimate the sum of the convergent series to within 0.11. Round your final answer to two decimal places.

$$\sum_{k=0}^{\infty} (-1)^k \frac{3}{k!}$$

Determine whether the series is convergent or divergent.

$$\sum_{k=10}^{\infty} (-1)^k \frac{7k-1}{k^3}$$

Use a known Taylor polynomial with n nonzero terms to estimate the value of the integral.

$$\int_{-\sqrt{\pi}}^{\sqrt{\pi}} 9\cos x^2 \, dx, \; n = 4$$

Round your answer to two decimal places.

Your Answer: _____

Find a power series representation and radius of convergence for $f(x) = \dfrac{34x}{(1-x^2)^2}$.

Determine whether the series converges or diverges.
For convergent series, find the sum of the series.

$$\sum_{k=0}^{\infty} (-1)^{k+1} \frac{13k}{k+11}$$

Find an equation of the tangent line to the curve defined parametrically by $x = t^3 - t$ and $y = t^4 - 5t^2 + 7$ at $t = 2$.

dy/dx= (dy/dt)/ (dx/dt)

(4t^3-10t)/ (3t^2 − 1) at t = 2

(32 − 20)/ (11) = 8/11 = m_{tan}

t = 2

x = 8 − 2 = 6

y = 16 − 20 + 7 = 3

(6, 3)

$y - 3 = 8/11(x - 6)$

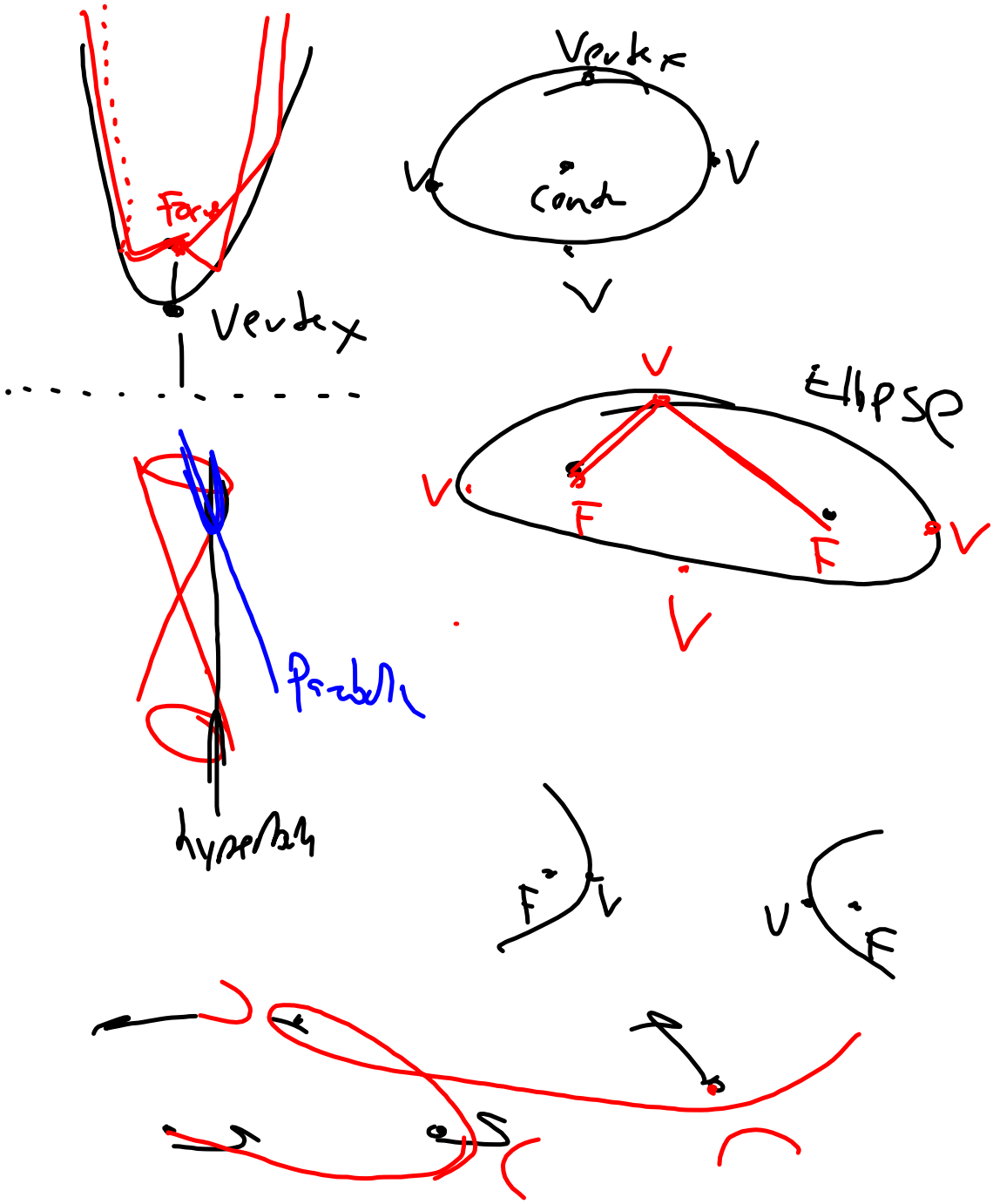
Identify the conic section and find the vertices and foci.

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

- A. This is an ellipse with vertices: $(-4, 0)$, $(8, 0)$ and foci: $\left(2-\sqrt{61}, 0\right)$, $\left(2+\sqrt{61}, 0\right)$.
- B. This is a hyperbola with vertices: $\left(2-\sqrt{61}, 0\right)$, $\left(2+\sqrt{61}, 0\right)$ and foci: $(-4, 0)$, $(8, 0)$.
- ✓ C. This is a hyperbola with vertices: $(-4, 0)$, $(8, 0)$ and foci: $\left(2-\sqrt{61}, 0\right)$, $\left(2+\sqrt{61}, 0\right)$.
- D. This is an ellipse with vertices: $\left(2-\sqrt{61}, 0\right)$, $\left(2+\sqrt{61}, 0\right)$ and foci: $(-4, 0)$, $(8, 0)$.

$$\frac{(-4-2)^2}{36} - \frac{0}{25} = 1$$

Cathy


Focus
Vertex
Vertex
V
V
Center
V
V
Ellipse
V
F
F
V
V
Parabola
Hyperbola
F
V
V
F

minus means hyperbola

For the hyperbola $\frac{(y-1)^2}{36} - \frac{(x+6)^2}{64} = 1$, find the center, vertices, foci and asymptotes.

up 1 left 6

A.

Center: (−1, 6); Vertices: (−1, −5), (−1, 7); Foci: (−1, −9), (−1, 11);

Asymptotes: $y = \pm\frac{3}{4}(x+1) + 6$

B.

Center: (1, −6); Vertices: (1, −5), (1, 7); Foci: (1, −9), (1, 11);

Asymptotes: $y = \pm\frac{3}{4}(x-1) - 6$

Mike

C.

Center: (−6, 1); Vertices: (−6, −5), (−6, 7); Foci: (−6, −9), (−6, 11);

Asymptotes: $y = \pm\frac{3}{4}(x+6) + 1$

D.

Center: (6, 1); Vertices: (6, −5), (6, 7); Foci: (6, −9), (−6, 11);

Identify the conic section and find the vertex and focus.

$(x-8)^2 + 81y^2 = 81$

✓ A. This is an ellipse with foci: $\left(8-\sqrt{80}, 0\right)$, $\left(8+\sqrt{80}, 0\right)$ and vertices: (−1, 0), (17, 0).

B. This is an ellipse with foci: (−1, 0), (17, 0) and vertices: $\left(8-\sqrt{80}, 0\right)$, $\left(8+\sqrt{80}, 0\right)$.

C. This is a hyperbola with foci: (−1, 0), (17, 0) and vertices: $\left(8-\sqrt{80}, 0\right)$, $\left(8+\sqrt{80}, 0\right)$.

D. This is a hyperbola with foci: $\left(8-\sqrt{80}, 0\right)$, $\left(8+\sqrt{80}, 0\right)$ and vertices: (−1, 0), (17, 0).

(8,0) - center

Jen

$y=0 \Rightarrow (x-8)^2 = 81$

$x-8=9$ or -9 $\quad x=17$ or $-1 \Rightarrow$ vertices $(17,0), (-1,0)$

Identify the conic section and find the vertex, focus and directrix.

$(x + 4)^2 - 49(y - 4) = 49$

- A. This is a hyperbola with $y = -\frac{37}{4}$,

  vertex: $(-4, 3)$ and focus: $(-4, \frac{61}{4})$.

- B. This is a parabola with $y = \frac{37}{4}$,

  vertex: $(4, 3)$ and focus: $(4, \frac{61}{4})$.

- C. This is a parabola with $y = -\frac{37}{4}$,

  vertex: $(-4, 3)$ and focus: $(-4, \frac{61}{4})$.

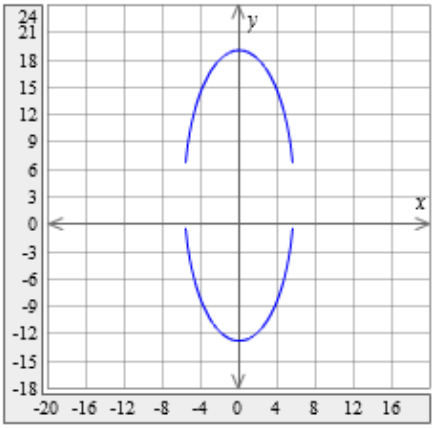
- D. This is a hyperbola with $y = \frac{37}{4}$,

  vertex: $(4, 3)$ and focus: $(4, \frac{61}{4})$

Clear.

Graph the conic section and find an equation.
All points such that the difference of the distances to the points (0, 20) and (0, −14) equals 32.

A.



$$\frac{(y-3)^2}{256} + \frac{x^2}{33} = 1.$$

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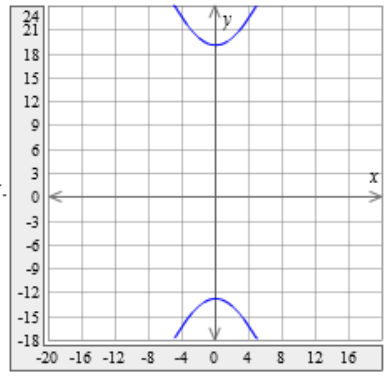
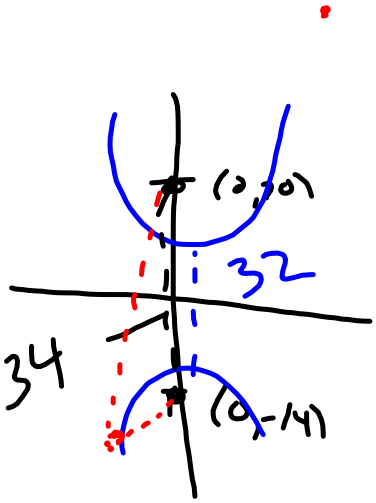
$$\frac{(y-3)^2}{256} - \frac{x^2}{33} = 1.$$

The graph is shown below.

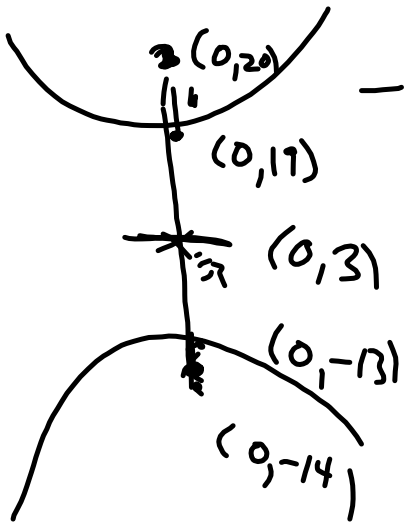




(0, 3)

a

Graph the conic section and find an equation.
All points such that the difference of the distances to the points (0, 20) and (0, −14) equals 32.



$$-\frac{(x-0)^2}{1}+\frac{(y-3)^2}{16^2}=1$$

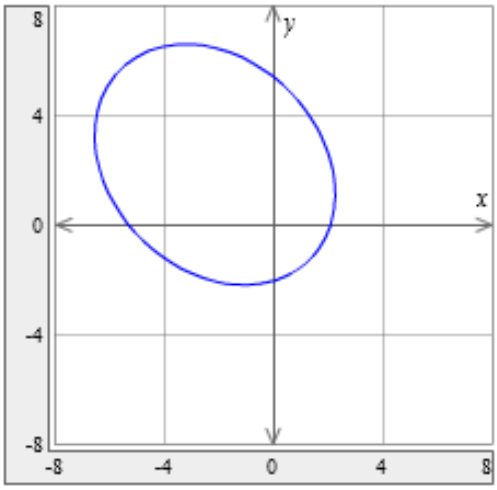
Warning

$$\sqrt{289-256}=\sqrt{33}$$

Select the graph and interpret the conic section.

$$r = \frac{-4.8}{\sin(\theta - \pi/4) - 1.6}$$

A.



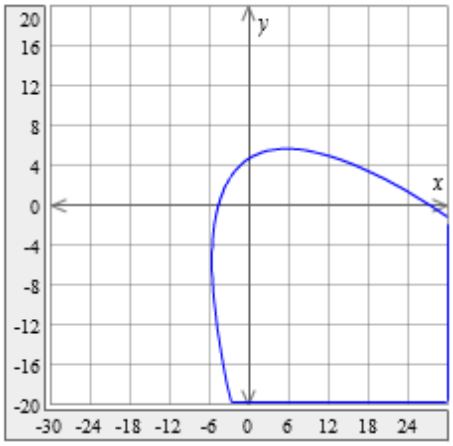
Justin

Select the graph and interpret the conic section.

$$r = \frac{-72}{9\cos(\theta + \pi/4) - 9}$$

It is a parabola.

B.



Kathleen

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Find parametric equations of the conic section $\frac{(x+8)^2}{49} + \frac{(y-4)^2}{64} = 1$.

- A. $\begin{cases} x = 7\cos t - 8 \\ y = 8\sin t + 4 \end{cases}$ with $0 \le t \le 2\pi$.
- B. $\begin{cases} y = 7\cos t + 8 \\ y = 8\sin t \end{cases}$ with $0 \le t \le 2\pi$.
- C. $\begin{cases} x = 7\cos t \\ y = 8\sin t \end{cases}$ with $0 \le t \le 2\pi$.
- D. $\begin{cases} x = \cos t + 4 \\ y = 8\sin t - 4 \end{cases}$ with $0 \le t \le 2\pi$.

Jenna