Using complete sentences, write the distance based definition of "ellipse". **SCORE: ____ / 2 PTS**

AN ELLIPSE IS THE LOCUS OF POINTS IN A PLANE WHOSE DISTANCES TO 2 FIXED POINTS ADD UP TO A FIXED CONSTANT

GRADED BY ME

Find the foci and vertices of the ellipse $3x^2 + 4y^2 + 6x - 32y + 19 = 0$. **SCORE: ____ / 5 PTS**

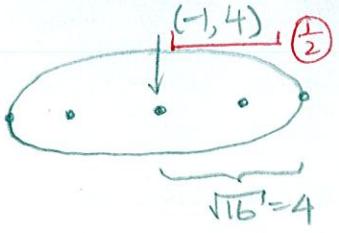
$3x^2+6x+4y^2-32y=-19$

$3(x^2+2x)+4(y^2-8y)=-19$

(½) $3(x^2+2x+1)+4(y^2-8y+16)=-19+3(1)+4(16)$ (½) (½)

$3(x+1)^2+4(y-4)^2=48$ (½)

$\frac{(x+1)^2}{16}+\frac{(y-4)^2}{12}=1$ (½)



$c^2=16-12=4$

$c=2$

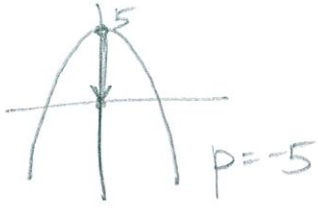
VERTICES $=(-1\pm4,4)$

$=(3,4),(-5,4)$ (1)

FOCI $=(-1\pm2,4)$

$=(1,4),(-3,4)$ (1)

The focus of a parabola is at the origin, and its vertex is at $(0, 5)$. **SCORE: ____ / 2 PTS**
Find the equation of the parabola.



$x^2=4(-5)(y-5)$

$x^2=-20(y-5)$

(½) (1) (½)

Fill in the blanks. **NO NEED TO SHOW WORK.** **SCORE: ____ / 3 PTS**

[a] The latera recta of an ellipse are perpendicular to THE MAJOR AXIS (1) and pass through THE FOCI (1).

[b] The eccentricity of the ellipse $\frac{x^2}{8}+\frac{y^2}{17}=1$ is $\frac{3\sqrt{17}}{17}$ (1).

$c^2=17-8=9 \rightarrow c=3$

$e=\frac{c}{a}=\frac{3}{\sqrt{17}}$

Find the equation of the ellipse with foci $(-7,5)$ and $(-7,-3)$, and a minor axis of length 10. **SCORE: ____ / 4 PTS**

CENTER $=\left(-7,\frac{5+-3}{2}\right)=(-7,1)$ ($\frac{1}{2}$)

- V
- F(−7,5)
- C(−7,1)
- F(−7,−3)
- V

4 ↑ between C and F(−7,5)

$\frac{1}{2}(10)=5$ between C(−7,1) and F(−7,−3)

$a^2=5^2+4^2$

$a^2=41$ ($\frac{1}{2}$)

$\frac{(x+7)^2}{25}+\frac{(y-1)^2}{41}=1$ (1) (+) (1) (=) ($\frac{1}{2}$)

Find the vertex, focus and equation of the directrix of the parabola $2x^2-16x+y+33=0$. **SCORE: ____ / 4 PTS**

$2x^2-16x=-y-33$

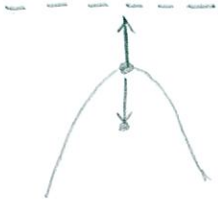
$x^2-8x=-\frac{1}{2}y-\frac{33}{2}$

$x^2-8x+16=-\frac{1}{2}y-\frac{33}{2}+16$

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

($\frac{1}{2}$) FOR EACH UNDERLINED ITEM

$(x-4)^2=-\frac{1}{2}(y+1) \rightarrow 4p=-\frac{1}{2} \rightarrow p=-\frac{1}{8}$



DIRECTRIX $y=-1+\frac{1}{8} \rightarrow y=-\frac{7}{8}$

VERTEX $(4,-1)$

FOCUS $(4,-1-\frac{1}{8})=(4,-\frac{9}{8})$

MUST HAVE "y = "