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 $3x^2 + 4y^2 + 6x - 24y - 9 = 0$. **SCORE: ____ / 5 PTS**

$3x^2+6x+4y^2-24y=9$

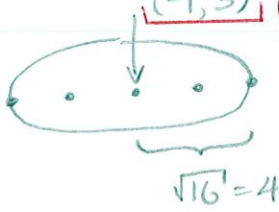
$3(x^2+2x)+4(y^2-6y)=9$ (½)

(½) $3(x^2+2x+1)+4(y^2-6y+9)=9+3(1)+4(9)$ (½)

$3(x+1)^2+4(y-3)^2=48$ (½)

$\frac{(x+1)^2}{16}+\frac{(y-3)^2}{12}=1$ (½)

(-1, 3) (½)



$c^2=16-12=4$

$c=2$

VERTICES $=(-1\pm4, 3)$

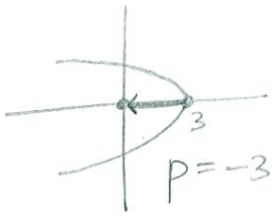
$=(3,3),(-5,3)$ (1)

FOCI $=(-1\pm2, 3)$

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

The focus of a parabola is at the origin, and its vertex is at $(3, 0)$. **SCORE: ____ / 2 PTS**

Find the equation of the parabola.



$y^2=4(-3)(x-3)$

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

(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).

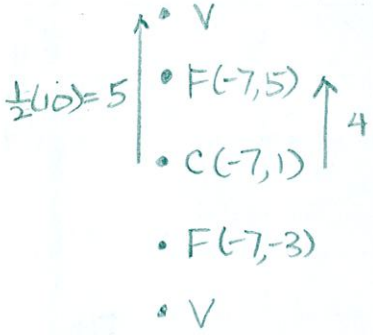
[b] The eccentricity of the ellipse $\frac{x^2}{12}+\frac{y^2}{13}=1$ is $\frac{\sqrt{13}}{13}$ (1).

$c^2 = 13-12 = 1 \rightarrow c = 1$

$e = \frac{c}{a} = \frac{1}{\sqrt{13}}$

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

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



$\frac{(x+7)^2}{9} + \frac{(y-1)^2}{25} = 1$

(1) (1/2) (1) (1/2)

$5^2 = 4^2 + b^2$

$b^2 = 9$ (1/2)

Find the vertex, focus and equation of the directrix of the parabola $2x^2 - 20x + y + 51 = 0$. **SCORE: ____ / 4 PTS**

$2x^2 - 20x = -y - 51$

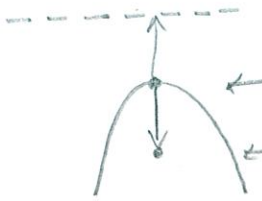
$x^2 - 10x = -\frac{1}{2}y - \frac{51}{2}$

$x^2 - 10x + 25 = -\frac{1}{2}y - \frac{51}{2} + 25$

$(x-5)^2 = -\frac{1}{2}y - \frac{1}{2}$

$(x-5)^2 = -\frac{1}{2}(y+1) \rightarrow 4p = -\frac{1}{2} \rightarrow p = -\frac{1}{8}$

(1/2) FOR EACH UNDERLINED ITEM



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

VERTEX $(5, -1)$

FOCUS $(5, -1 - \frac{1}{8}) = (5, -\frac{9}{8})$

MUST HAVE "y = "