Write the formal definition of an ellipse used in lecture. **SCORE: ____ / 2 PTS**

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

Find the equation of the ellipse with vertices $(\pm 6, 0)$ and foci $(\pm 3, 0)$.

SCORE: _____ / 3 PTS

$6^2 = b^2 + 3^2$

$36 = b^2 + 9$

$b^2 = 27$

$\frac{x^2}{36} + \frac{y^2}{27} = 1$ (1) (1) (1/2)

(1/2)

Find the co-ordinates of the vertices and foci of the ellipse $\frac{x^2}{68}+\frac{y^2}{88}=1$.

SCORE: _____ / 3 PTS

↑ TALL + SKINNY

$88 = 68 + c^2$

$c^2 = 20$

$c = 2\sqrt{5}$

VERTICES $(0, \pm\sqrt{88}) = (0, \pm 2\sqrt{22})$ (1½)

FOCI $(0, \pm 2\sqrt{5})$ (1½)

SUBTRACT ½ POINT
EACH ANSWER YOU FORGOT ±

Find the co-ordinates of the focus and vertex, and the equation of the directrix, of the parabola $y^2 + 16x + 12y - 44 = 0$.

SCORE: ____ / 5 PTS

$y^2 + 12y = -16x + 44$

$y^2 + 12y + 36 = -16x^2 + 80$ (1/2) (1)

$(y+6)^2 = -16(x-5)$ (1)

$4p = -16$

$p = -4$ (1/2)

VERTEX $(5, -6)$ (1/2)

FOCUS $(5-4, -6)$

$= (1, -6)$ (1/2)

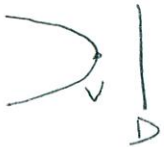
DIRECTRIX $x = 5 + 4$

$x = 9$ (1)

SUBTRACT ½ POINT IF YOU FORGOT $x =$ OR WROTE $y =$ INSTEAD

Find the equations of the following parabolas. **SCORE: _____ / 7 PTS**

[a] vertex at the origin, directrix $x = 12$



$y^2 = 4(-12)x$

$y^2 = -48x$ (1) (1) (1)

[b] focus $(6, 2)$, directrix $y = -5$

VERTEX $= (6, \frac{2-5}{2}) = (6, -\frac{3}{2})$

$p = 2 - -\frac{3}{2} = \frac{7}{2}$

$(x-6)^2 = 4(\frac{7}{2})(y+\frac{3}{2})$ ($\frac{1}{2}$)

$(x-6)^2 = 14(y+\frac{3}{2})$ (1) ($1\frac{1}{2}$) (1)