Find the co-ordinates of the vertices and foci of the ellipse $\frac{x^2}{42}+\frac{y^2}{54}=1$.

SCORE: ____ / 3 PTS

$54 = 42 + c^2$

$c^2 = 12$

$c = 2\sqrt{3}$

↑ TALL + SKINNY

VERTICES $(0, \pm\sqrt{54}) = (0, \pm 3\sqrt{6})$ (1½)

FOCI $(0, \pm 2\sqrt{3})$ (1½)

SUBTRACT ½ POINT EACH ANSWER YOU FORGOT ±

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 $(\pm 7, 0)$ and foci $(\pm 5, 0)$.

SCORE: ____ / 3 PTS

$7^2 = b^2 + 5^2$

$49 = b^2 + 25$

$b^2 = 24$

$\frac{x^2}{49} + \frac{y^2}{24} = 1$

(1) (1) ($\frac{1}{2}$)

($\frac{1}{2}$)

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

[a] vertex at the origin, directrix $x = 6$

$y^2 = 4(-6)x$

$y^2 = -24x$ (1) (1) (1)

[b] focus $(7, 1)$, directrix $y = -6$

VERTEX $= \left(7, \frac{1-6}{2}\right) = \left(7, -\frac{5}{2}\right)$

$p = 1 - -\frac{5}{2} = \frac{7}{2}$

$(x-7)^2 = 4\left(\frac{7}{2}\right)\left(y+\frac{5}{2}\right)$ ($\frac{1}{2}$)

$(x-7)^2 = 14\left(y+\frac{5}{2}\right)$ (1) ($1\frac{1}{2}$) (1)

Find the co-ordinates of the focus and vertex, and the equation of the directrix, of the parabola $y^2 + 24x + 8y - 56 = 0$.

SCORE: ____ / 5 PTS

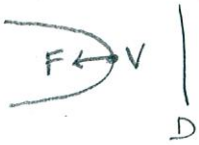
$y^2 + 8y = -24x + 56$

$\frac{1}{2}$ $y^2 + 8y + 16 = -24x + 72$ (1)

$(y+4)^2 = -24(x-3)$ (1)

$4p = -24$

$p = -6$ ($\frac{1}{2}$)



VERTEX $(3, -4)$ ($\frac{1}{2}$)

FOCUS $(3-6, -4)$

$= (-3, -4)$ ($\frac{1}{2}$)

DIRECTRIX $x = 3 + 6$

$x = 9$ (1)

SUBTRACT $\frac{1}{2}$ POINT IF YOU FORGOT $x =$ OR WROTE $y =$ INSTEAD