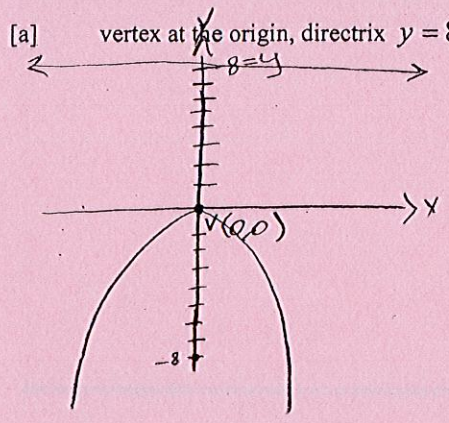
SCORE: _____ / 20 POINTS

1. NO CALCULATORS ALLOWED
2. UNLESS STATED OTHERWISE, YOU MUST SIMPLIFY ALL ANSWERS
3. SHOW PROPER PRECALCULUS LEVEL WORK TO JUSTIFY YOUR ANSWERS

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

[a] vertex at the origin, directrix $y = 8$

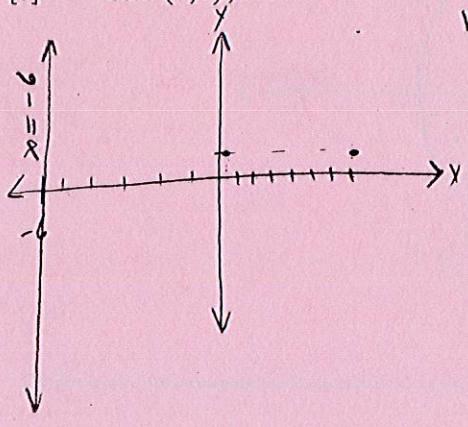


$x^2 = 4py$

$x^2 = 4(8)y$

$x^2 = 32y$ (1) (1)

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



V: $(1/2, 1)$ (*)

$y^2 = 4px$

$y^2 = 4(6.5)x$ or $4(\frac{13}{2})x$ (1/2)

$y^2 = 26x$ (*) (*) (1/2)

Write the formal definition of a parabola used in lecture. SCORE: 1/2 / 2 PTS

The parabula is the focis of point on plain and the distance to the fixeed point called foci and its constant point.

Find the co-ordinates of the focus and vertex, and the equation of the directrix, of the parabola $x^2 + 10x + 20y - 55 = 0$.

SCORE: 5 / 5 PTS

$x^2 + 10x + 25 = -20y + 55 + 25$ (½)

$(x+5)^2 = -20y + 80$ (1)

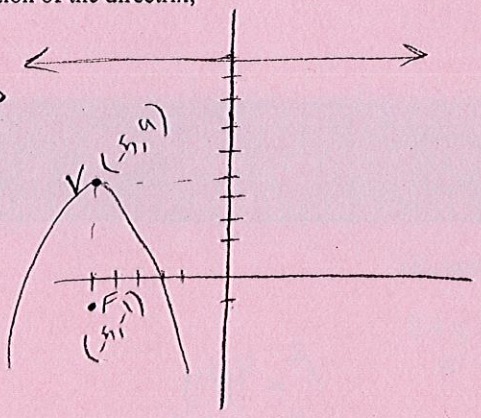
$(x+5)^2 = -20(y-4)$ (1)

V: $(-5, 4)$ (½)

P: $4p = -20 \rightarrow -5$ (½)

Dir-x: $y = 9$ (1)

Foci: $(-5, -1)$ (½)



Find the equation of the ellipse with vertices $(0, \pm 6)$ and foci $(0, \pm 5)$.

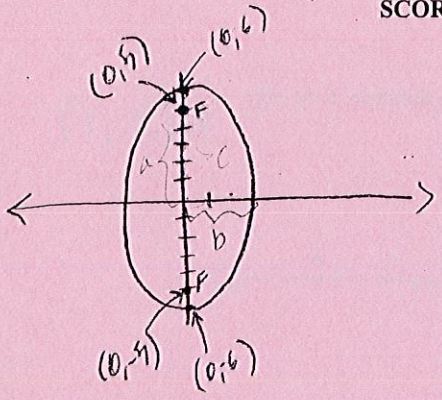
SCORE: ____ / 3 PTS

$\frac{x^2}{9} + \frac{y^2}{36} = 1$ (½) (1) (½)

$b^2 = a^2 - c^2$
$b^2 = 36 - 25$
$b^2 = 9$ (*)

$\frac{x^2}{b^2} + \frac{y^2}{a^2} = 1$

$\frac{x^2}{3^2} + \frac{y^2}{6^2} = 1$



Find the co-ordinates of the vertices and foci of the ellipse $\frac{x^2}{50} + \frac{y^2}{32} = 1$.

SCORE: 0 / 3 PTS

$\frac{x^2}{50} + \frac{y^2}{32} = 1$

$\frac{x^2}{\sqrt{50}} + \frac{y^2}{\sqrt{32}} \Rightarrow \frac{x^2}{\sqrt{25 \cdot 2}} + \frac{y^2}{\sqrt{2 \cdot 16}} = \frac{x^2}{5\sqrt{2}} + \frac{y^2}{4\sqrt{2}}$

V: $(0, 0)$

Foci: $(\pm 5\sqrt{2}, 0)$