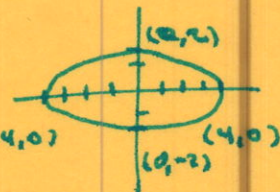


MAT 142 Homework #9 Key

1a. $\frac{x^2}{16} + \frac{y^2}{4} = 1$ $a=4, b=2$
 $c(0,0)$

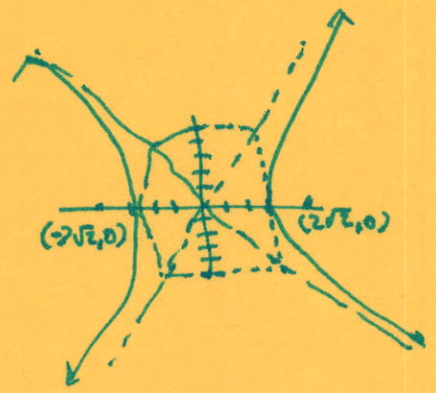
$16-4=12$ foci $(\pm\sqrt{3}, 0)$ $(-4, 0)$



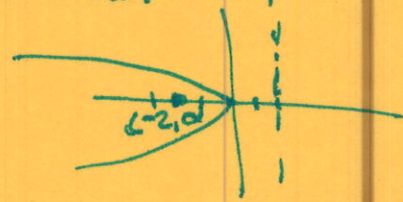
b. $\frac{x^2}{8} - \frac{y^2}{25} = 1$

$a=2\sqrt{2}$ $b=5$ $y = \pm \frac{5}{2\sqrt{2}}x$

$8+25=33$ foci $(\pm\sqrt{33}, 0)$



c. $y^2 = -8x$



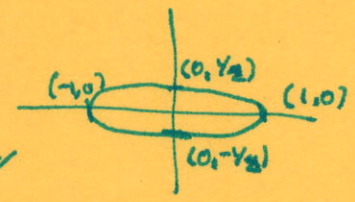
d. $x^2 = 1 - 4y^2$

$x^2 + 4y^2 = 1$

$x^2 + \frac{y^2}{1/4} = 1$

$a=1$
 $b=1/2$
 $1 - 1/4 = 3/4$ $c = \sqrt{3}/2$

foci $(\pm\sqrt{3}/2, 0)$ $x=2$



e. $y = \pm\sqrt{x^2 - 3}$

$y^2 = x^2 - 3$

$y^2 - x^2 = -3$

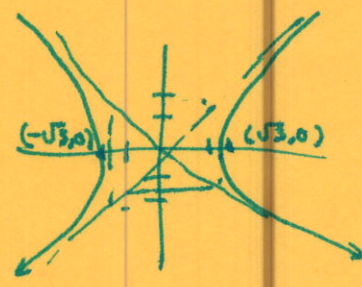
$x^2 - y^2 = 3$

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

$a=\sqrt{3}$
 $b=\sqrt{3}$

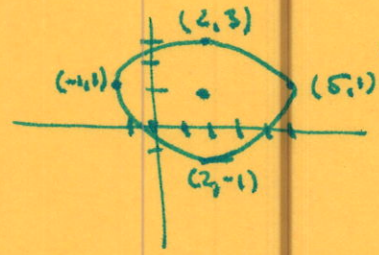
$y = \pm x$

$3+3=6$ foci $(\pm\sqrt{6}, 0)$



f. $\frac{(x-2)^2}{9} + \frac{(y-1)^2}{4} = 1$

$a=3, b=2$ $9-4=5$



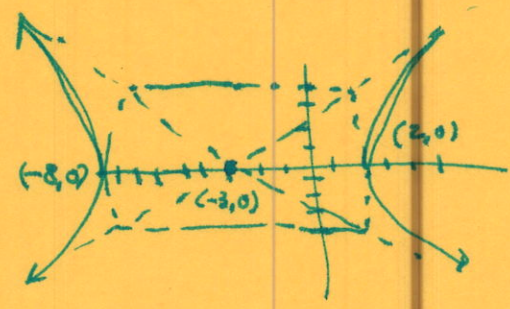
$c = (2, 1)$
 foci $(2 \pm \sqrt{5}, 1)$

g. $\frac{(x+3)^2}{25} - \frac{y^2}{16} = 1$

$a=5, b=4$

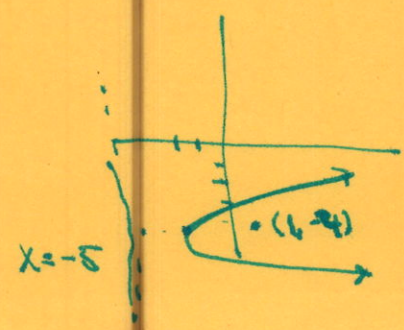
$25+16=41$ $y = \pm \frac{4}{5}(x+3)$

foci $(-3 \pm \sqrt{41}, 0)$



h. $(y+4)^2 = 12(x+2)$

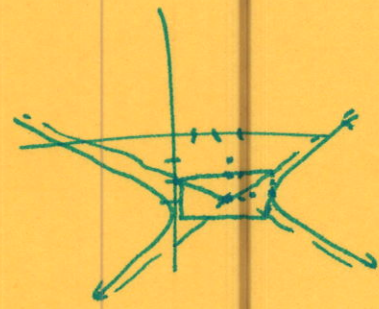
Center $(-2, -4)$
 $a=3$



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

$\frac{(X-3)^2}{4} - (Y+3)^2 = 1$

$a=2, b=1$
 $4+1=5$
 $c=(3,-3)$
 $v(1,-3)(5,-3)$
 $f(3\pm\sqrt{5}, -3)$
 $y+3 = \pm\frac{1}{2}(x-3)$



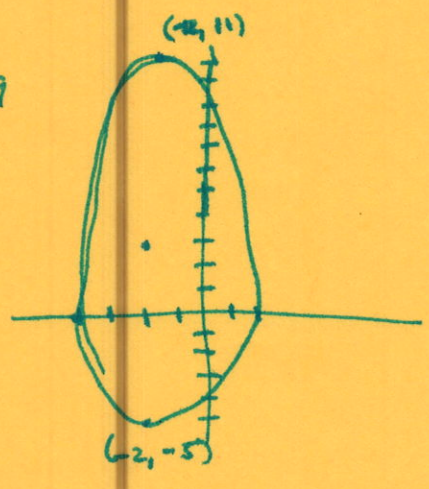
j. $4x^2 + y^2 + 16x - 6y - 39 = 0$

$4x^2 + y^2 + 16x - 6y = 39$
 $4x^2 + 16x + y^2 - 6y = 39$
 $4(x^2 + 4x + 4) + (y^2 - 6y + 9) = 39 + 16 + 9$

$\frac{4(x+2)^2}{64} + \frac{(y-3)^2}{64} = \frac{64}{64}$

$\frac{(x+2)^2}{16} + \frac{(y-3)^2}{64} = 1$

$a=8$
 $b=4$
 $64-16=48$
 $c=(-2, 3)$
 $f(-2, \pm 4\sqrt{3}+3)$



k. $9x^2 - 16y^2 - 36x - 64y + 116 = 0$

$9(x^2 - 4x + 4) - 16(y^2 + 4y + 4) = -116 + 36 + 64$

$\frac{9(x-2)^2}{-16} - \frac{16(y+2)^2}{-16} = \frac{-16}{-16}$

$(y+2)^2 - \frac{(x-2)^2}{(\frac{16}{9})} = 1$

$1^2 + \frac{16}{9} = \frac{25}{9} \cdot c = \frac{5}{3}$
 $c=(2,-2)$
 $a=1$
 $b=\frac{4}{3}$
 $v(2, -3)(2, -1)$
 $f(2, -\frac{1}{3}), (2, -\frac{5}{3})$
 $y+2 = \pm\frac{3}{4}(x-2)$

