

438

5, 6, 8-11, 39-42

5. $9x^2 + y^2 + 126x + 2y + 433 = 0$

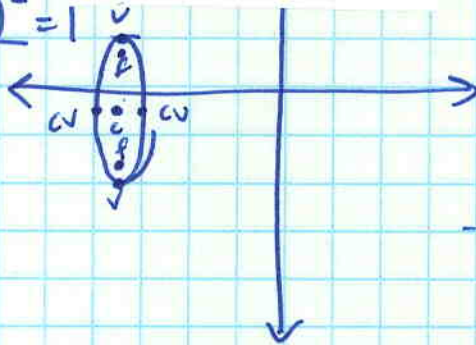
$9x^2 + 126x + y^2 + 2y = -433$

$9(x^2 + 14x + 49 - 49) + (y+1)^2 - 1 = -433$

$9(x+7)^2 - 441 + (y+1)^2 = -432$

$9(x+7)^2 + (y+1)^2 = 9$

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



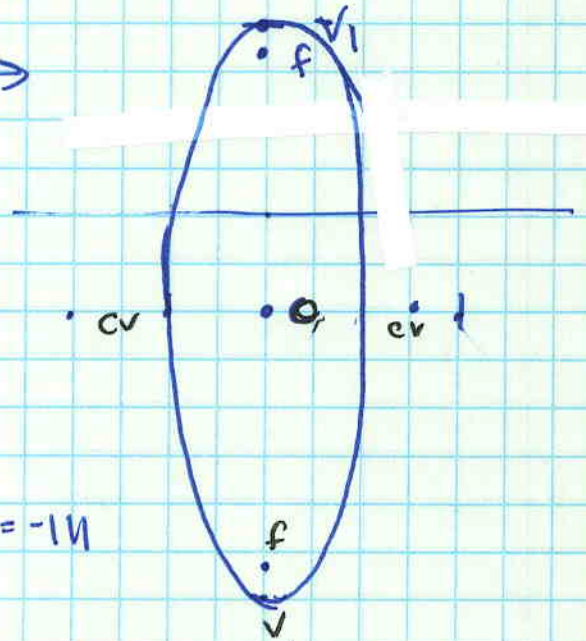
center (-7, -1)

$a=1$ $b=3$ $c=\sqrt{8} \approx 2.8$

$f_1 = (-7, 1.8)$ $f_2 = (-7, -3.8)$

$v_1 = (-7, 2)$ $v_2 = (-7, -4)$

$cv_1 = (-8, -1)$ $cv_2 = (-6, -1)$



6. $x^2 + 25y^2 - 12x - 100y + 111 = 0$

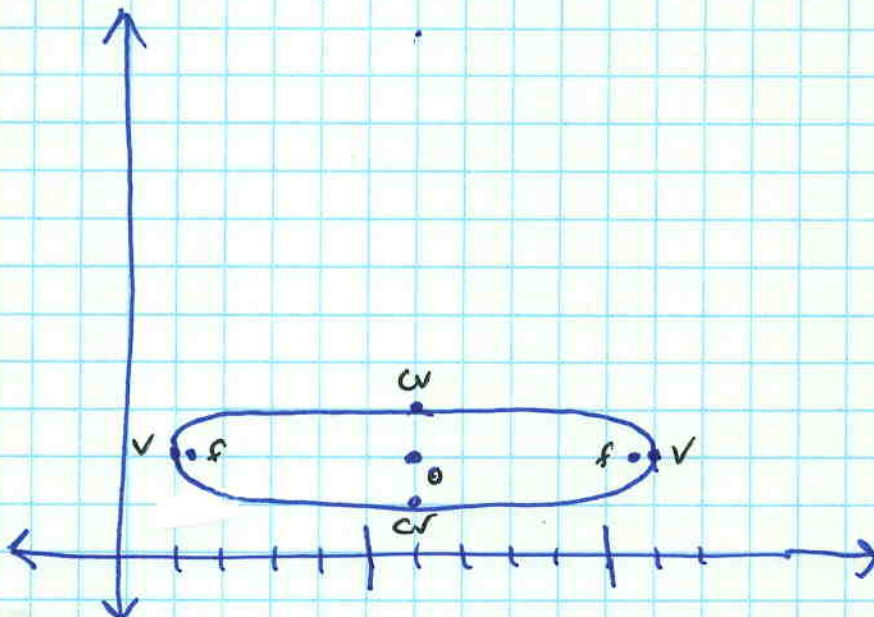
$x^2 - 12x + 6^2 - 6^2 + 25(y^2 - 4y + 2^2 - 2^2) = -111$

$(x-6)^2 - 36 + 25(y-2)^2 - 100 = -111$

$(x-6)^2 + 25(y-2)^2 = 25$

$\frac{(x-6)^2}{25} + \frac{(y-2)^2}{1} = 1$ center (6, 2) $a=5$ $b=1$ $c=\sqrt{24} \approx 4.9$

$f_1 (10.9, 2)$ $f_2 (1.1, 2)$ $v_1 (11, 2)$ $v_2 (1, 2)$ $cv_1 (6, 3)$ $cv_2 (6, 1)$



8. $V_1 (4,3) (4,-9)$ $2b=8$ $2a=12$ $a=6$ $b=4$
 $h=4$ $k=-3$

$$\frac{(x-4)^2}{16} + \frac{(y+3)^2}{36} = 1$$

9. $V (7,2) (-3,2)$ $f (6,2, -2,2)$ $c^2 = a^2 + b^2$
 $\leftarrow 2a=10$ $2c=8$ $16=25+b^2$
 $a=5$ $h=2, k=2$ $c=4$ $b^2=9$ $b=3$

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

10. maj $(-13,2)$ to $(1,2)$ $h=6$ $k=2$
 min $(-6,4)$ to $(-6,0)$ $2a=14$ $2b=4$
 $a=7$ $b=2$
 $\leftarrow \frac{(x+6)^2}{49} + \frac{(y-2)^2}{4} = 1$ $a^2=49$ $b^2=4$

11. $f (-6,9) (-6,-3)$ maj 20 $cen (-6,3)$

\downarrow $2c=12$ $2a=20$ $c^2 = a^2 - b^2$ $b^2=64$
 $c=6$ $a=10$ $36 = 100 - b^2$ $b=8$
 $c^2=36$ $a^2=100$

$$\frac{(x+6)^2}{64} + \frac{(y-3)^2}{100} = 1$$

39 $2b=2$ $b=1$ $O=(1,3)$ $\frac{(x-1)^2}{16} + \frac{(y-3)^2}{1} = 1$
 $2a=8$ $a=4$

40. $2a=10$ $a=5$ $O=(4,1)$ $\frac{(x-4)^2}{9} + \frac{(y-1)^2}{25} = 1$
 $2b=6$ $b=3$

41. $2a=14$ $2b=8$ $\frac{(x-2)^2}{14} + \frac{(y-2)^2}{49} = 1$
 $a=7$ $b=4$
 $O=(2,2)$

42 $2a=16$ $a=8$ $\frac{(x-4)^2}{64} + \frac{(y-1)^2}{36} = 1$
 $2b=12$ $b=6$
 $O=(4,1)$