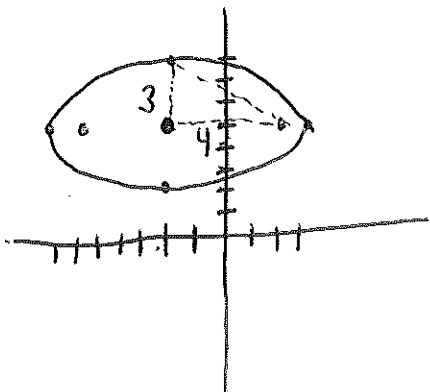


Conic Sections Review - wkst 1

①



Foci: $(2, 5), (-6, 5)$
 Vertices: $(3, 5), (-7, 5)$

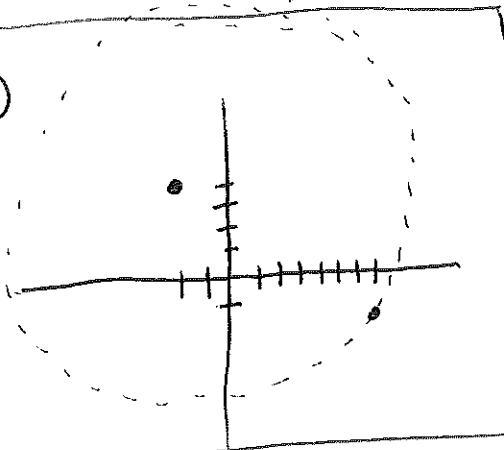
$b = 3$
 $c = 4$
 $a = 5$

$b^2 + c^2 = a^2$
 $3^2 + 4^2 = a^2$
 $9 + 16 = a^2$
 $25 = a^2$

$$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$$

$$\frac{(x+2)^2}{25} + \frac{(y-5)^2}{9} = 1$$

②



$$(x-h)^2 + (y-k)^2 = r^2$$

$$(x+2)^2 + (y-4)^2 = 106$$

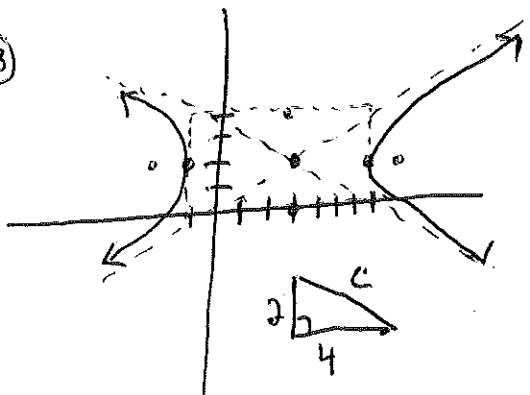
$$r = \sqrt{(4+1)^2 + (-2-7)^2}$$

$$r = \sqrt{5^2 + (-9)^2}$$

$$r = \sqrt{25 + 81}$$

$$r = \sqrt{106}$$

③



$$\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$$

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

Asym: $y = 2 \pm \frac{1}{2}(x-3)$

$$2^2 + 4^2 = c^2$$

$$4 + 16 = c^2$$

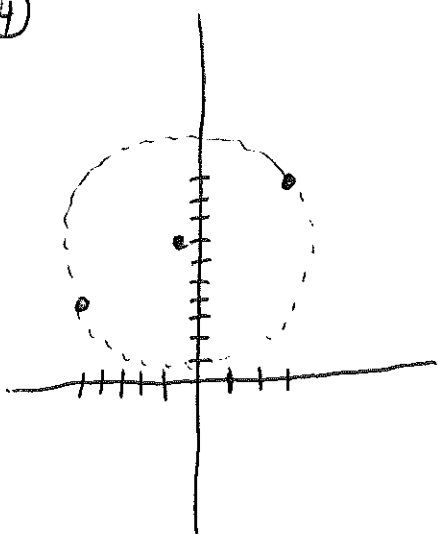
$$20 = c^2$$

$$c = \sqrt{20} = 2\sqrt{5}$$

Foci: $(3-2\sqrt{5}, 2), (3+2\sqrt{5}, 2)$

Vertices: $(-1, 2), (7, 2)$

④



$$(x-h)^2 + (y-k)^2 = r^2$$

$$(x+1)^2 + (y-7)^2 = 25$$

$(3, 10), (-5, 4)$

$$\left(\frac{3+(-5)}{2}, \frac{10+4}{2} \right)$$

$(-1, 7) \rightarrow$ center

Diam. Dist. = $\sqrt{(-5-3)^2 + (4-10)^2}$

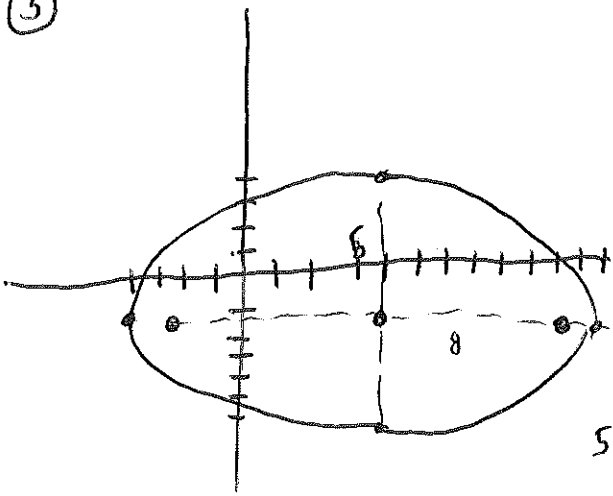
$$= \sqrt{(-8)^2 + (-6)^2}$$

$$= \sqrt{64 + 36}$$

$$= \sqrt{100} = 10$$

Diam. Dist. = 10 \rightarrow Radius = 5

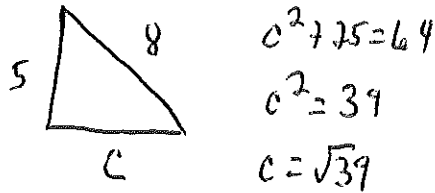
⑤



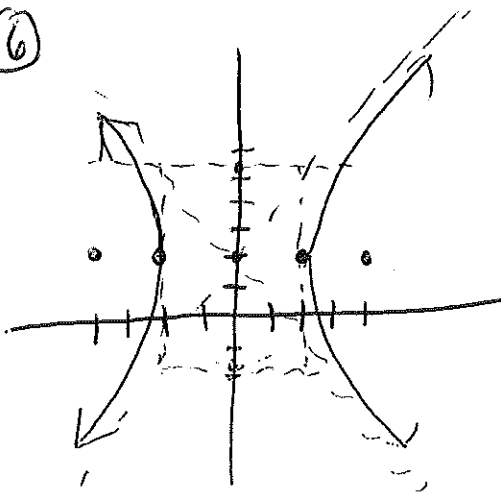
$$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$$

$$\frac{(x-4)^2}{64} + \frac{(y+1)^2}{25} = 1$$

V: (12, 7), (-4, 7)
F: (4 + √39, -1), (4 - √39, -1)



⑥



$$\frac{(x-h)^2}{a^2} - \frac{(y-k)^2}{b^2} = 1$$

$$\frac{x^2}{4} - \frac{(y-2)^2}{12} = 1$$

$$\text{Asym: } y = 2 \pm \sqrt{3}x$$

Center: (0, 2)

$a = 2$

$b = 2\sqrt{3}$

$c = 4$

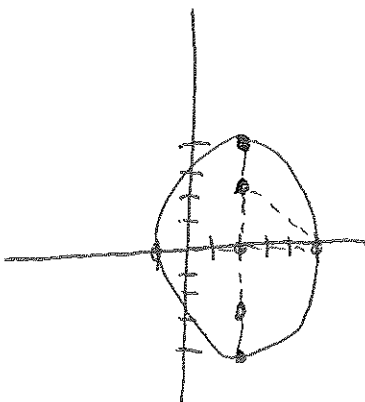
$a^2 + b^2 = c^2$

$4 + b^2 = 16$

$b^2 = 12$

$b = \sqrt{12} = 2\sqrt{3}$

⑦



$$\frac{(x-h)^2}{b^2} + \frac{(y-k)^2}{a^2} = 1$$

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

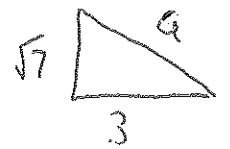
Center: (2, 0)

$c = \sqrt{7}$

$b = 3$

$a = 4$

Vertices: (2, 4)
(2, -4)



$7 + 9 = 4^2$

$16 = 4^2$

$a = 4$

$$8) 18x^2 - 144x + 12y^2 - 48y = -120$$

$$18(x^2 - 8x + 16) + 12(y^2 - 4y + 4) = -120 + 12 \cdot 8 + 48$$

$$\frac{18(x-4)^2}{216} + \frac{12(y-2)^2}{216} = \frac{216}{216}$$

$$\boxed{\frac{(x-4)^2}{12} + \frac{(y-2)^2}{18} = 1}$$

Center: $(4, 2)$ Foci: $(4, 2 \pm \sqrt{6})$

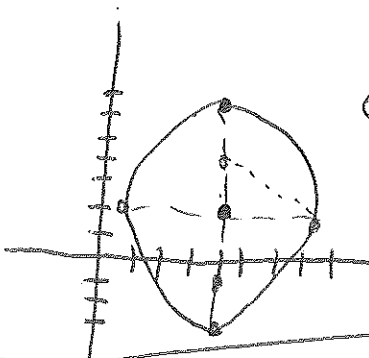
$$a = \sqrt{18} = 3\sqrt{2}$$

Vertices: $(4, 2 \pm 3\sqrt{2})$

$$b = \sqrt{12} = 2\sqrt{3}$$

$$(4, 2 \pm 3\sqrt{2})$$

$$c = \sqrt{6}$$



$$c^2 + 12 = 18$$

$$c^2 = 6$$

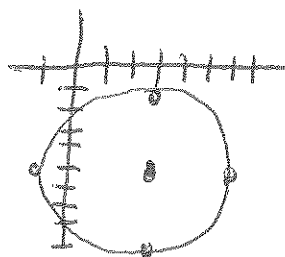
$$c = \sqrt{6}$$

$$9) x^2 - 6x + 9 + y^2 + 10y + 25 = -18 + 9 + 25$$

Center: $(3, -5)$

radius = 4

$$\boxed{(x-3)^2 + (y+5)^2 = 16}$$



$$10) \frac{(x-3)^2}{16} + \frac{(y+5)^2}{4} = 1$$

Center: $(3, -5)$

Vertices: $(-1, -5)$

$(7, -5)$

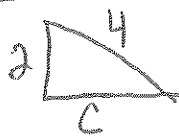
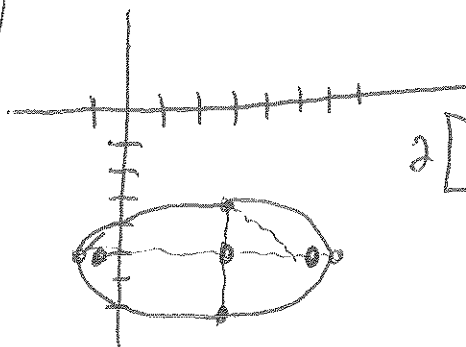
Foci: $(3 \pm 2\sqrt{3}, -5)$

$$a = 4$$

$$b = 2$$

$$c = 2\sqrt{3}$$

Ellipse



$$c^2 + 4 = 16$$

$$c^2 = 12$$

$$c = \sqrt{12}$$

$$11) \frac{(x+4)^2}{9} - \frac{(y-1)^2}{25} = 1$$

Hyperbola

Transverse Axis \rightarrow X

Center: $(-4, 1)$

$$a = 3$$

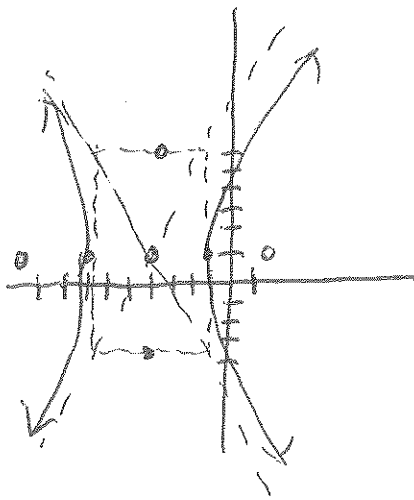
$$a^2 + b^2 = c^2$$

$$b = 5$$

$$9 + 25 = c^2$$

$$c = \sqrt{34}$$

$$34 = c^2$$



Vertices: $(-1, 1), (-7, 1)$

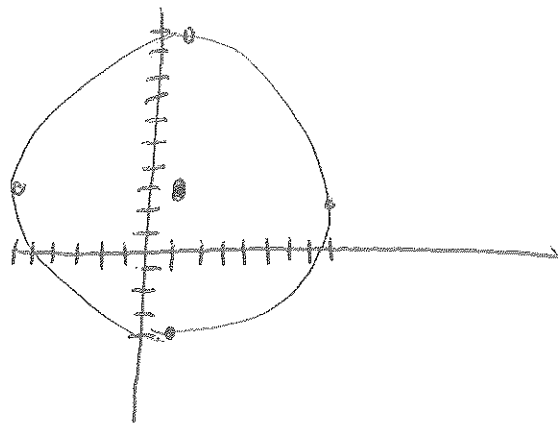
Focus: $(-4 \pm \sqrt{34}, 1)$

Asym: $x = 1 \pm \frac{5}{3}(x+4)$

⑫ $(x-1)^2 + (y-3)^2 = 49$ Circle

Center: (1, 3)

radius = 7



⑬ $\frac{(y-1)^2}{16} - \frac{(x-2)^2}{4} = 1$

Center: (2, 1)

Hyperbola - transverse axis $\rightarrow y$

Vertices: (2, 5) (2, -3)

Foci: (2, 1 ± 2√5)

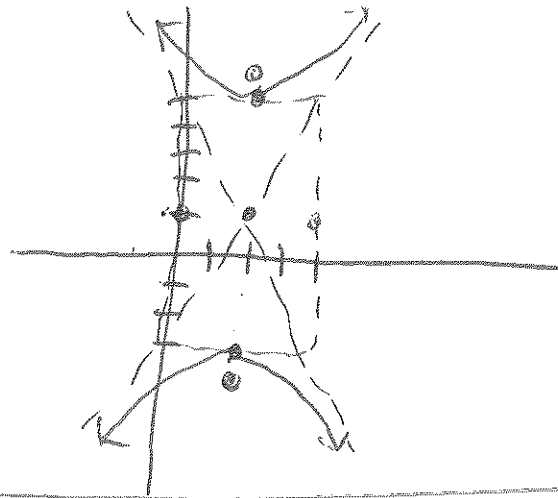
Asym: $y = 1 \pm 2(x-2)$

$a = 4$ $4^2 + 2^2 = c^2$

$b = 2$ $16 + 4 = c^2$

$c = 2\sqrt{5}$ $20 = c^2$

$\sqrt{20} = c$



⑭ $\frac{(x+4)^2}{9} + \frac{(y-6)^2}{25} = 1$

Center: (-4, 6)

Vertices: (-4, 11) (-4, 1)

Foci: (-4, 10) (-4, 2)

$a = 5$

$b = 3$

$c = 4$

