10-2 Parabolas

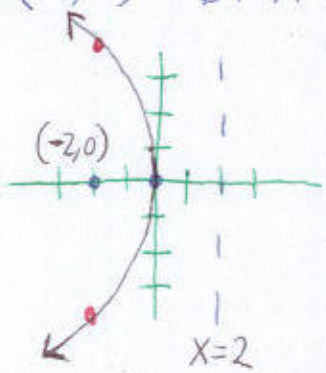
1) Identify the focus and directrix. $x = -12y^2$	2) Identify the focus and directrix. $y = \frac{1}{4}x^2$
3) Sketch the graph and identify the vertex, focus, and directrix: $x = -\frac{1}{8}y^2$	4) Sketch the graph and identify the vertex, focus, and directrix: $x^2 = 16y$

① $c = \frac{1}{4(-12)} = \frac{1}{-48}$ Focus: $(-\frac{1}{48}, 0)$ Directrix: $x = \frac{1}{48}$

② $c = \frac{1}{4(\frac{1}{4})} = \frac{1}{1} = 1$ F: (0, 1) D: $y = -1$

③ $c = \frac{1}{4(-\frac{1}{8})} = \frac{1}{-\frac{1}{2}} = 1 \cdot \frac{-2}{1} = -2$

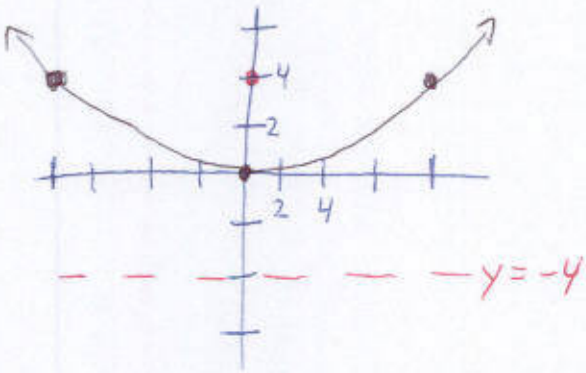
F: (-2, 0) D: $x = 2$



④ $\frac{16y}{16} = \frac{x^2}{16}$ $y = \frac{1}{16}x^2$

$c = \frac{1}{4(\frac{1}{16})} = 1 \div \frac{1}{4} = 1 \cdot 4 = 4$

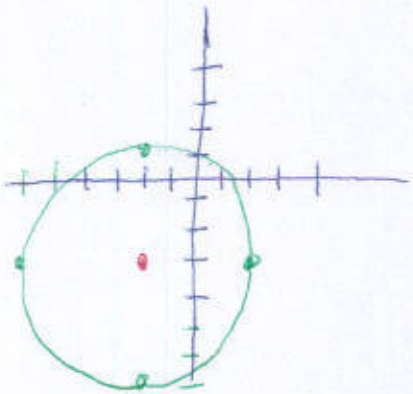
F: (0, 4) D: $y = -4$



10-3 Circles

1) Graph: $(y+3)^2+(x+2)^2=16$	2) Find the center and radius: $(x-1)^2+(y+5)^2=30$

(1)



Center: $(-2,-3)$ $r=\sqrt{16}=4$

(2) Center $(1,-5)$

radius $=\sqrt{30}\approx 5.5$

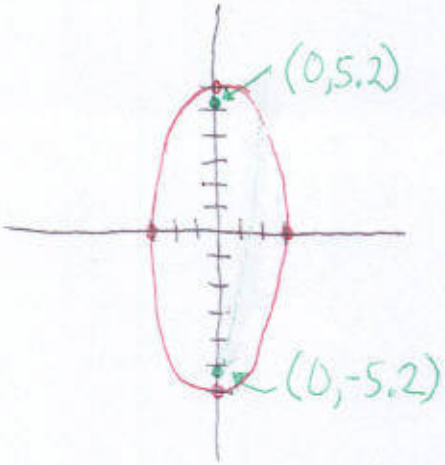
10-4 Ellipses

1) Graph and label the foci: $\frac{x^2}{9}+\frac{y^2}{36}=1$	2) Find the foci: $14x^2+4y^2=28$

1) $\sqrt{a^2}=\sqrt{36}$ $a=\pm 6$

$\sqrt{b^2}=\sqrt{9}$ $b=\pm 3$

$\sqrt{c^2}=\sqrt{36-9}$ $c=\pm\sqrt{27}=\pm 3\sqrt{3}\approx\pm 5.2$



2) $\frac{14x^2}{28}+\frac{4y^2}{28}=\frac{28}{28}$

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

$\sqrt{c^2}=\sqrt{7-2}$

$c=\sqrt{5}$

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

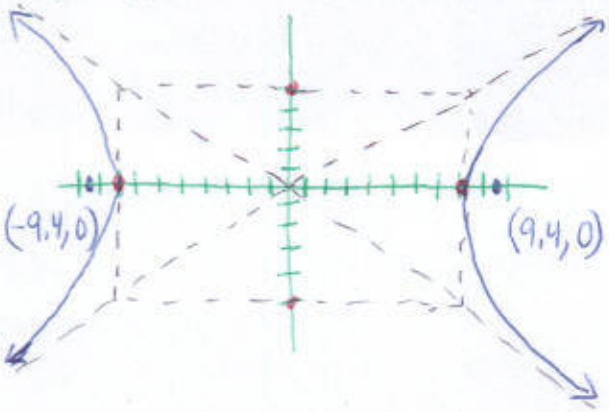
10-5 Hyperbolas

1) Graph and label the foci: $\frac{x^2}{64}-\frac{y^2}{25}=1$	2) Graph: $16y^2-4x^2=16$	3) Find the vertices and asymptotes: $9y^2-4x^2=36$

1. $\sqrt{a^2}=\sqrt{64}$ $\sqrt{b^2}=\sqrt{25}$

$a=\pm 8$ $b=\pm 5$

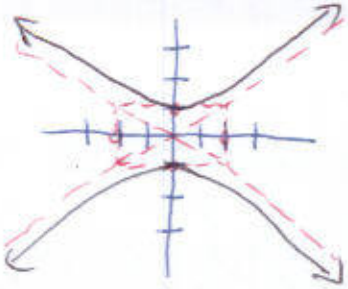
$\sqrt{c^2}=\sqrt{64+25}$ $c=\pm\sqrt{89}\approx 9.4$



2. $\frac{16y^2}{16}-\frac{4x^2}{16}=\frac{16}{16}$

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

$a=\pm 1$ $b=\pm 2$



3. $\frac{9y^2}{36}-\frac{4x^2}{36}=\frac{36}{36}$

$\frac{y^2}{4}-\frac{x^2}{9}=1$

$a=\pm 2$ $(0,\pm 2)$ Vertices

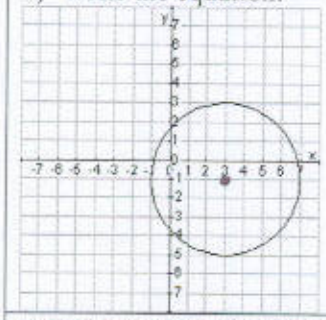
$b=\pm 3$

Asymptotes

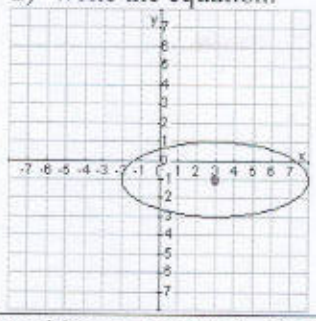
$y=\pm\frac{2}{3}x$

10-6 Translating Conic Sections

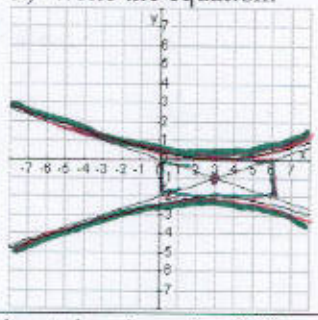
1) Write the equation:



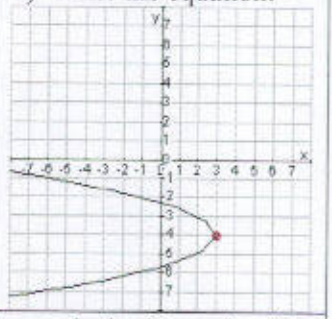
2) Write the equation:



3) Write the equation:



4) Write the equation:



5) Write the equation for an ellipse with a center at (-2,-3) and a horizontal major axis of 10 and a vertical minor axis of 8.

1 Center (3,-1)
radius = 4

$(x-3)^2+(y+1)^2=16$

2 $a=\pm5$ $b=\pm2$

$\frac{(x-3)^2}{25}+\frac{(y+1)^2}{4}=1$

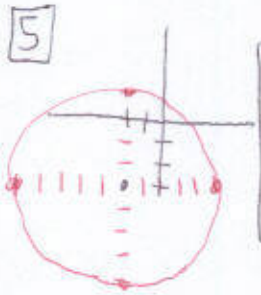
3 $a=\pm1$ $b=\pm3$

$\frac{(y+1)^2}{1}-\frac{(x-3)^2}{9}=1$

4 Vertex (3,-4)

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

5



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

Classify the conic. Change it into standard form and then graph it. Find the center/vertex. Find and label foci and/or other important points on the graph

6) $x^2+y^2-2x-8y=-13$

7) $-4y^2+25x^2-100x=0$

8) $25x^2+y^2-100x-2y=-76$

9) $4x^2-24x-y+37=0$

⑥ $(x^2-2x+\underline{1})+(y^2-8y+\underline{16})=-13+\underline{1}+\underline{16}$

$(x-1)^2+(y-4)^2=4$ center $(1,4)$ radius $=2$

⑦ $-4y^2+(25x^2-100x)=0$

$-4y^2+25(x^2-4x+\underline{4})=0+25(4)$

$\frac{-4y^2}{100}+\frac{25(x-2)^2}{100}=\frac{100}{100}$

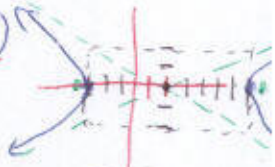
$\frac{(x-2)^2}{4}-\frac{y^2}{25}=1$ Center $(2,0)$

$a=\pm 2$ $b=\pm 5$

$c=\pm\sqrt{4+25}=\pm\sqrt{29}\approx 5.4$

Foci: $(7.4,0)$ & $(-3.4,0)$

Vertices $(7,0)$ & $(-3,0)$



⑧ $(25x^2-100x)+(y^2-2y)=-76$

$25(x^2-4x+\underline{4})+(y^2-2y+\underline{1})=-76+\underline{100}+\underline{1}$

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

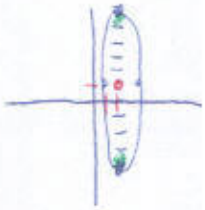
Center $(2,1)$

Co-Vertices $(1,1)$ & $(3,1)$

Vertices $(2,6)$ $(2,-4)$

Foci $(2,5.9)$ $(2,-3.9)$

$c=\pm\sqrt{24}\approx 4.9$



⑨ $4(x^2-6x+\underline{9})=y-37+\underline{36}$

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

$+1 \quad +1$

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

Vertex $(3,1)$

focus $(3,1\frac{1}{16})$

$c=\frac{1}{4(4)}=\frac{1}{16}$