Precalc 10.7-10.8

Find the equations of conic sections that have been translated or rotated
Graph transformations of conic sections
Use the discriminant to identify conic sections
Find the angle of rotation for a given equation
Graph and solve systems of second degree equations and inequalities

Quiz 10.7-10.8 is tomorrow

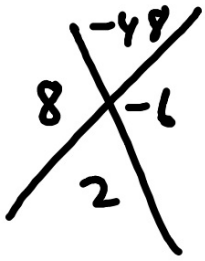
$x - y = 2$ $\quad x^2 = 100 - y^2$

$x = y + 2$ $\quad (y+2)^2 = 100 - y^2$

$y^2 + 4y + 4 = 100 - y^2$

$\frac{2y^2}{2} + \frac{4y}{2} - \frac{96}{2} = \frac{0}{2}$

$y^2 + 2y - 48 = 0$



$(y+8)(y-6) = 0$

$y = -8 \quad y = 6$

$x + 8 = 2$
$-8 \quad -8$
$x = -6$

$x - 6 = 2$
$+6 \quad +6$
$x = 8$

$(-6, -8)$

$(8, 6)$

15. $4x^2+y^2=25 \quad -1=2x+y \quad -2x-1$

$-2x-1=y \quad -2x-1$

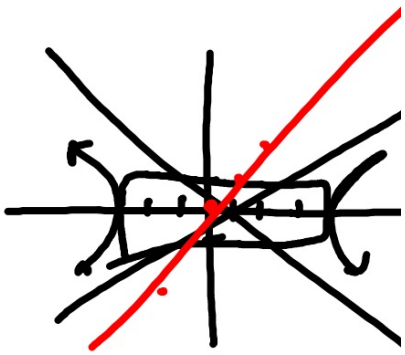
$4x^2+(-2x-1)^2=25 \quad 2x+1$

$4x^2+(4x^2+4x+1)=25 \quad 4x^2\ 2x$

$8x^2+4x-24=0$

17. $x - y = 0$ $\quad \frac{(x-1)^2}{9} - y^2 = 1$

$x = y$



$9 \cdot \frac{(x-1)^2}{9} - 9 \cdot x^2 = 9 \cdot 1$

$(x-1)^2 - 9x^2 = 9$

$x^2 - 2x + 1 - 9x^2 = 9$

$\frac{-8x^2}{-2} - \frac{2x}{-2} - \frac{8}{-2} = \frac{0}{-2}$

$4x^2 + x + 4 = 0$

$x = \frac{-1 \pm \sqrt{1 - 4 \cdot 4 \cdot 4}}{8}$

$x = \frac{-1 \pm \sqrt{-63}}{8}$

$x = \frac{-1 \pm \sqrt{63}\,i}{8}$

$16 \leq 0 + 0$

$16 \leq x^2 + y^2$

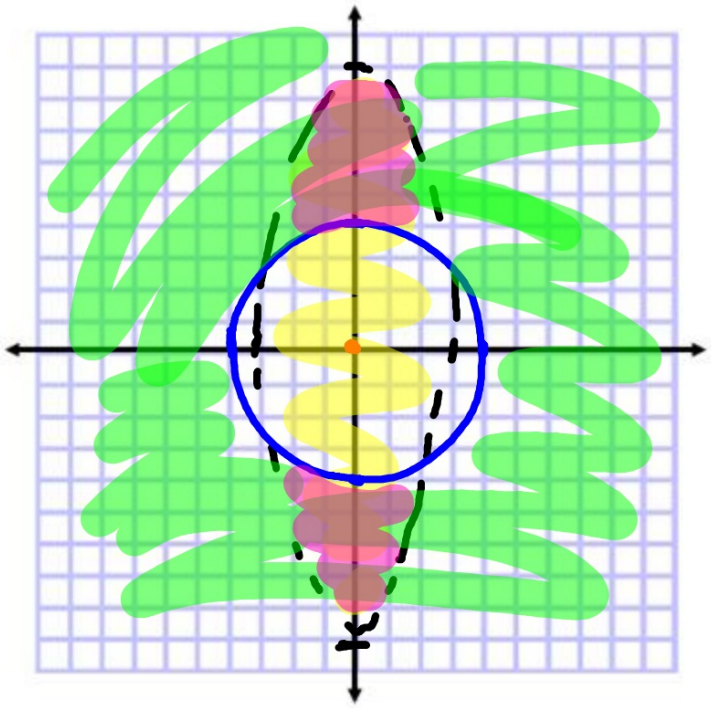
$x^2 + y^2 = 16$

* $y^2 < 81 - 9x^2$

$0 < 81 - 0$

$\frac{9x^2}{81}$ +

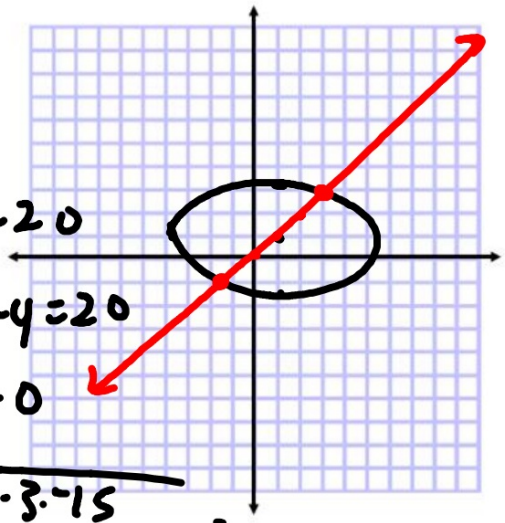
$\frac{x^2}{9} + \frac{y^2}{81} =$



5. $\dfrac{(x-1)^2}{20} + \dfrac{(y-1)^2}{5} = 1$

$x - y = 0$

$x = y$



What is it?
Estimate answers
Subs/elim

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

$x^2 - 2x + 1 + 4x^2 - 8x + 4 = 20$

$3x^2 - 10x - 15 = 0$

$x = \dfrac{10 \pm \sqrt{100 - 4 \cdot 3 \cdot -15}}{6}$

$= \dfrac{10 \pm \sqrt{280}}{6}$ $\quad \dfrac{10 \pm 16.7}{6}$

$(4.45, 4.45)$

$(-1.1, -1.1)$

7. $9x^2 - 4y^2 = 36$
$x^2 + y^2 = 4$

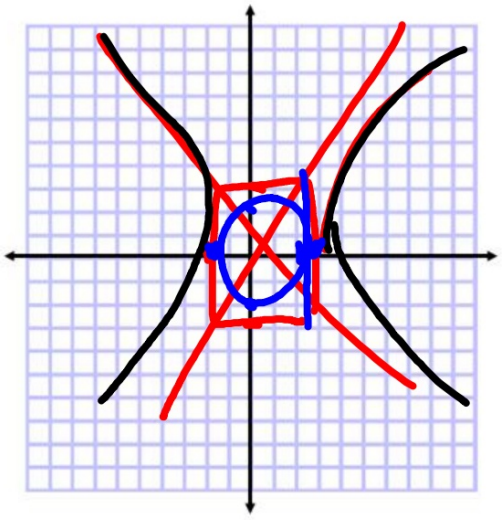
$4x^2 + 4y^2 = 16$

$4 + y^2 = 4$
$y^2 = 0$
$y = 0$

$\frac{13x^2}{13} = \frac{52}{13}$

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

$x^2 = 4$
$x = \pm 2$



$\frac{9x^2}{36} - \frac{4y^2}{36} = 1$

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

$(2, 0)$
$(-2, 0)$

Boundary: solid/open
Test point: inside/outside

3 Graph the solutions for the system of inequalities.

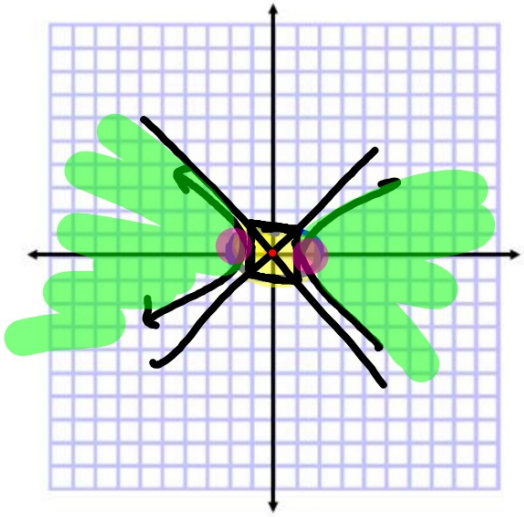
$x^2 + 4y^2 \leq 4$

$y^2 > x^2 + 1$

$x^2 - y^2 = 1$

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

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



10. $(x-5)^2 + 2y < 10$

$0 - 9 \geq -9$

$-9 \geq 0$

$(x-5)^2 = 2y + 10$

$(x-5)^2 = -2(y-5)$

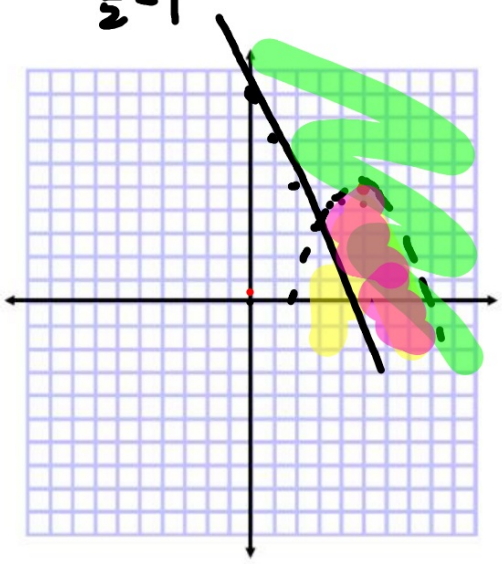
$(-5)^2 + 0 < 10$

$25 + 0 < 10$

$\frac{-2}{4} = \frac{4p}{4}$ $\quad 4p = -2$

$y = -2x + 9$

$-\frac{1}{2} = ?$



WB 10.8