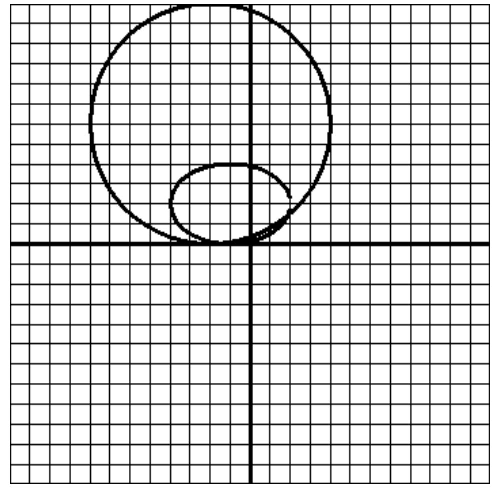
Name ___________________________________ Honors Advanced Mathematics
June 4, 2014 Practice Test (Chapter 8) Answers



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

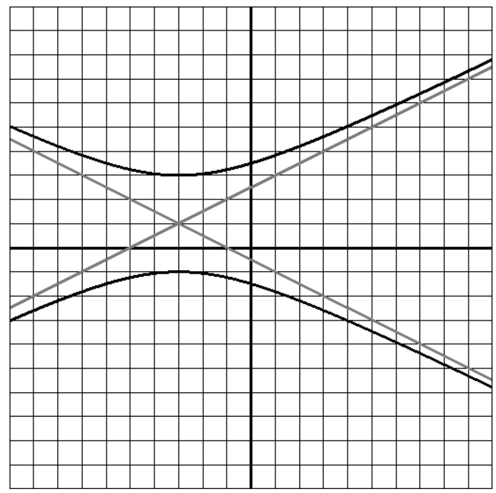
b. Use Pythagorean relationship to get that foci are $\sqrt{5}$ away from the center.
Foci: $(-1 \pm \sqrt{5}, 2)$.

Center of new conic N is $(-2, 6)$. Dilation factors are 6 in both directions, so it's a circle

c. $x(t) = 6\cos(t) - 2$, $y(t) = 6\sin(t) + 6$.

d. circle, $(x+2)^2 + (y-6)^2 = 36$.

e. see graph



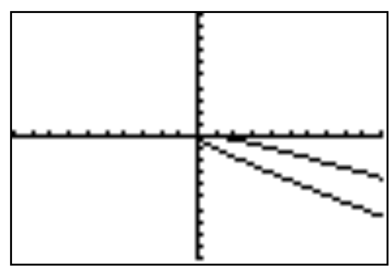
2. **a.** $B^2 - 4AC = 16$ so it's a hyperbola

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

c. $(-3, 1 \pm 2)$, so $(-3, 3)$ and $(-3, -1)$

d. $y - 1 = \pm\frac{1}{2}(x+3)$

e. see graph



3. **a.** $B^2 - 4AC = 0$ so it's a parabola.

b. $\tan(2\alpha) = -\frac{4}{3} \Rightarrow \alpha \approx 63.43°$.

c. Apply quadratic formula to $(4)y^2 + (4x)y + (x^2 - x) = 0$
and get $y = \frac{-4x \pm \sqrt{(4x)^2 - 4\cdot 4\cdot(x^2 - x)}}{2\cdot 4} = \frac{-x \pm \sqrt{x}}{2}$.

d. see screenshot for $[-10, 10]$ by $[-10, 10]$

4. **a.** parabola should go to the left from the vertex; directrix is vertical line $x = 9$.

b. distance from (x, y) to the focus $= \sqrt{(x-1)^2 + (y+2)^2}$
distance from (x, y) to the directrix $= 9 - x$

c. $\sqrt{(x-1)^2 + (y+2)^2} = 9 - x$

d. $(x-1)^2 + (y+2)^2 = (9-x)^2$
$x^2 - 2x + 1 + (y+2)^2 = x^2 - 18x + 81$
$(y+2)^2 = -16x + 80$
$-\frac{1}{16}(y+2)^2 + 5 = x$

e. *Using function mode:* $y = -2 \pm \sqrt{-16x + 80}$

OR *Using parametric mode:* $x = -\frac{1}{16}(t+2)^2 + 5,\ y = t.$

5. **a.** 1st clue: half-hyperbola; 2nd clue: ellipse

b. see X's on graph

c. $y^2 - \dfrac{x^2}{15} = 1$, $\dfrac{x^2}{3^2} + \dfrac{y^2}{5^2} = 1$.

d. A good method: solve first equation for y^2, then substitute into second equation.

Intersections ≈ (±2.90, –1.25).