Scrabble Review KEY

Monday, May 4, 2015 2:14 PM

Conics Review

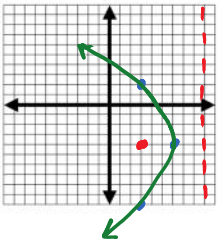
Calculator OK

SCRABBLE

1. Write an equation for each conic section described below. Use the graph to help you (if you need it!)

a. Focus (3, -4) and directrix of x = 9

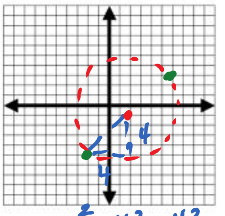
$(y+4)^2 = -12(x-6)$



b. Of a circle whose diameter has endpoints located at (-2,-5) and (6, 3).

$\Delta x = 8$, $\Delta y = 8$ } $r = 4$

$(x-2)^2 + (y+1)^2 = 32$



$r^2 = 4^2 + 4^2$

$r = \sqrt{32}$

c. Of the ellipse with a center at (1, -8), a focus at (1, -2), and the end of the major axis at (1,0)

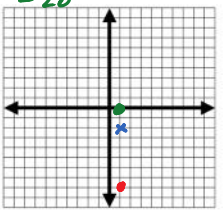
$b = 8,\ f = 6$

$f = \sqrt{b^2 - a^2}$

$6 = \sqrt{64 - a^2}$

$a^2 = 28$

$\frac{(x-1)^2}{28} + \frac{(y+8)^2}{64} = 1$



d. Of a hyperbola with foci at (6,0) and (-6,0); transverse axis length = 8.

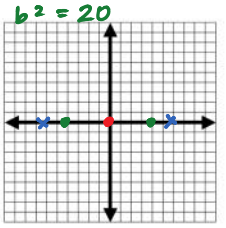
$a = 4,\ f = 6$

$f = \sqrt{a^2 + b^2}$

$6 = \sqrt{16 + b^2}$

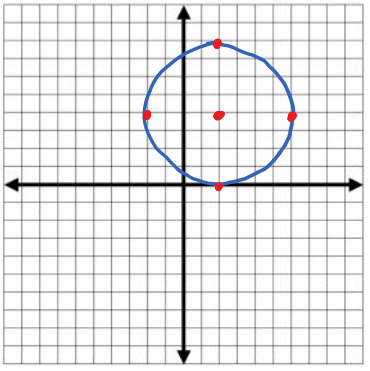
$b^2 = 20$

$\frac{x^2}{16} - \frac{y^2}{20} = 1$



2. Graph the conic section on the grid given. Identify features such as the vertex, equation of the directrix, focus point, focal width (parabola); center, endpoints of the major/minor axis and foci (ellipse); radius and center (circle); center, vertices, slope of the asymptotes and foci (hyperbola).

a. $(x-2)^2 + (y-4)^2 = 16$

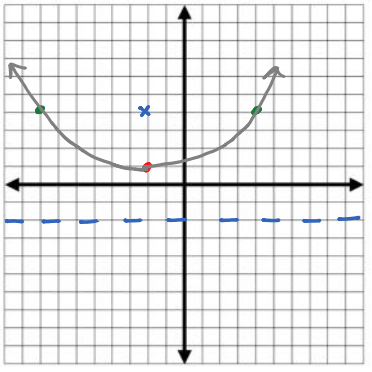


CIRCLE

$r = 4$

center: (2,4)

b. $(x+2)^2 = 12(y-1)$



PARABOLA

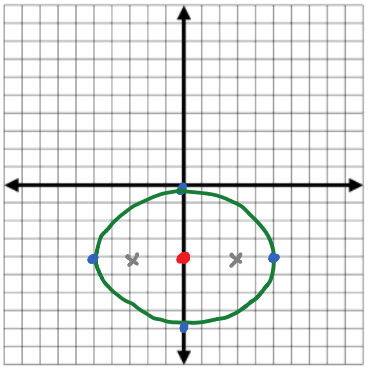
directrix: $y = -2$

focus: (-2,4)

vertex: (-2, 1)

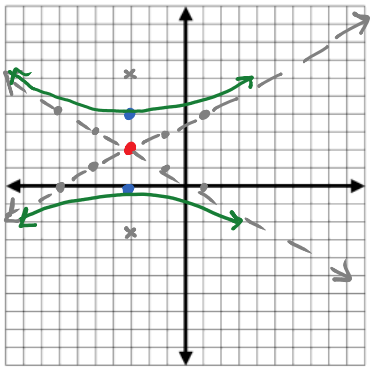
FW = 12

c. $\frac{x^2}{25}+\frac{(y+4)^2}{16}=1$ $F=\sqrt{25-16}=\sqrt{9}=3$



ELLIPSE
center: (0,-4)
major axis: (-5,-4)
(5,-4)
minor axis: (0,0)
(0,-8)
focus: (-3,-4)
(3,-4)

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



hyperbola
center: (-3,2)
vertices: (-3,4)
(-3,0)
$m=\pm 1/2$
$F=(-3,2\pm\sqrt{20})$

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3. Write parametric equations for each of the following.

a. An ellipse whose center is at (-2,3) and whose major axis (vertical) has length 10 and minor axis of length 2.

$x=-2+5\cos t$
$y=3+\sin t$

b. Write the parametric equations of a circle whose center is at (-1, 4) and has radius of length 4.

$x=-1+4\cos t$
$y=4+4\sin t$

c. $\frac{(y-3)^2}{25}-\frac{(x+1)^2}{9}=1$

$x=-1+3\tan t$
$y=3+5\sec t$

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4. Eliminate the parameter:

a. $x=3+4\cos t;\ y=-1+6\sin t$ ELLIPSE

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

b. $x=-2+3\sec t, y=1+4\tan t$ hyperbola

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

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5. For each expanded equation, write down the name of the shape and then put it into general form.

a. $9y^2-25x^2-36y-150x-414=0$

$9y^2-36y-25x^2-150x=414$

$9(y^2-4y\ \underline{+4})-25(x^2+6x\ \underline{+9})=414\ \underline{+36}\ \underline{-225}$

$\frac{9(y-2)^2}{225}-\frac{25(x+3)^2}{225}=\frac{225}{225}$

$\frac{(y-2)^2}{25}-\frac{(x+3)^2}{9}=1$ (hyperbola)

b. $3x^2-6x=6y-15$

$3(x^2-2x+\underline{1})=6y-15\ \underline{+3}$

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

$(x-1)^2=2(y-2)$ (parabola)