

Algebra II Pre-AP -- Assignment 49 -- Ellipses

For #1 - 3, graph each ellipse; state the coordinates of the center and foci; and state the length of the major axis (the sum of the focal radii).

A Problems (Required)	B Problems (for additional practice)
1) $5x^2 + 9y^2 = 45$	1) $4x^2 + 5y^2 = 20$
2) $25x^2 + 16y^2 = 25$	2) $9x^2 + 4y^2 = 9$
3) $\frac{(x-2)^2}{25} + \frac{(y+3)^2}{16} = 1$	3) $\frac{(x+2)^2}{4} + \frac{(y-3)^2}{25} = 1$

For #4 - 6, write the equation of each ellipse from the given information. Sketching the graph might help.

4) Vertices $(\pm 5, 0)$ and endpoints of minor axis $(0, \pm 3)$	4) Vertices $(0, \pm 7)$ and endpoints of minor axis $(\pm 2, 0)$
5) Vertices $(1, 7)$ and $(-5, 7)$; endpoints of minor axis have y-coordinates of 6 and 8.	5) Vertices $(-4, -3)$ and $(6, -3)$; endpoints of minor axis have y-coordinates of -2 and -4 .
6) One vertex at $(3, -8)$ and tangent to both axes.	6) One vertex at $(-2, 10)$ and tangent to both axes.

For #7 - 10, follow the instructions for #1 - 3 above.

7) $18(x+1)^2 + 5(y-2)^2 = 90$	7) $5(x+1)^2 + 24(y-2)^2 = 120$
8) $4x^2 + y^2 + 6y - 7 = 0$	8) $x^2 + 4y^2 + 6x - 7 = 0$
9) $25x^2 + 16y^2 + 150x = 160y - 225$	9) $25x^2 + 4y^2 + 50x + 16y - 59 = 0$
10) $2x^2 + 2y^2 + 8x - 12y - 42 = 0$	10) $3x^2 + 3y^2 + 12x - 18y - 63 = 0$

For #11 - 14, write the equation of each ellipse from the given information.

11) Foci $(0, 0)$ and $(4, 0)$ and major axis of length 8	11) Foci $(0, 0)$ and $(0, 8)$ and major axis of length 16.
12) Center $(2, -1)$, vertex $(2, 0.5)$, minor axis of length 2.	12) Center $(-3, 4)$, vertex $(1, 4)$, minor axis of length 6.
13) Center $(3, 2)$, $a = 3c$, vertices $(1, 2)$ and $(5, 2)$.	13) Center $(0, 4)$, $a = 2c$, vertices $(\pm 4, 4)$
14) Vertices $(0, 2)$, $(4, 2)$ and endpoints of minor axis $(2, 3)$, $(2, 1)$.	14) Vertices $(5, 0)$, $(5, 12)$ and endpoints of minor axis $(1, 6)$, $(9, 6)$.

Algebra II Pre-AP -- Assignment 50 -- Hyperbolas

Graph the following hyperbolas showing all asymptotes as dashed lines.

Find the coordinates of the center and foci and write the equations of the asymptotes.

1) $25x^2 - 4y^2 = 100$	1) $4x^2 - 25y^2 = 100$
2) $4x^2 - 9y^2 + 36 = 0$	2) $9x^2 - 4y^2 + 36 = 0$
3) $\frac{(x-1)^2}{16} - \frac{(y+2)^2}{9} = 1$	3) $\frac{(x+3)^2}{4} - \frac{(y-1)^2}{25} = 1$
4) $(x-3)^2 - (y+2)^2 = 1$	4) $(x+3)^2 - (y-2)^2 = 1$
5) $x^2 - y^2 + 6x + 10y - 7 = 0$	5) $x^2 - y^2 + 6x + 10y - 12 = 0$
6) $x^2 - 4y^2 - 2x - 16y - 11 = 0$	6) $4x^2 - 9y^2 - 16x - 18y - 29 = 0$
7) $16x^2 - 9y^2 + 64x + 18y + 199 = 0$	7) $9x^2 - 16y^2 + 18x + 64y - 199 = 0$

For #8 - 11, write the equation of each hyperbola from the given information.

8) Foci $(4, 1)$ and $(-2, 1)$ and vertices 2 units apart.	8) Foci $(0, 2)$ and $(10, 2)$ and vertices 8 units apart.
9) Foci $(0, -\sqrt{13})$ and $(0, \sqrt{13})$ and asymptotes $y = \pm \frac{3}{2}x$	9) Foci $(0, -\sqrt{6})$ and $(0, \sqrt{6})$ and asymptotes $y = \pm \frac{\sqrt{2}}{2}x$.
10) Center $(-2, -1)$, one vertex at $(-2, 9)$ and one focus at $(-2, 12)$	10) Center $(-3, -4)$, one vertex at $(7, -4)$ and one focus at $(9, -4)$
11) Foci $(5, -9)$ and $(5, -1)$ and difference of focal radii 6.	11) Foci $(3, -8)$ and $(3, 2)$ and difference of focal radii 8.
12) The slope m of the line tangent to the hyperbola $y^2 - x^2 = 9$ at any point (x, y) is given by $m = \frac{x}{y}$. Find the point on the graph in Quadrant II that has a tangent line with slope -0.5 .	