

Answers For Conic Sections in General Form

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Algebra 2

Parabolas

#	General Form	Standard Form	Opening	Width	Vertex	Axis	Focus	Directrix	Points
1	$y=x^2+4x-5$								
2	$y=x^2+2x-3$								
3	$y=x^2+4x+4$								
4	$y=x^2-4$								
5	$y=x^2+3x+2$								
6	$y=x^2-5x+4$								
7	$y=2x^2-3x-2$								
8	$y=\frac{1}{2}x^2+2x-2\frac{1}{2}$								
9	$y=x^2-x+12$								
10	$y=2x^2-2$								
11	$x=4y^2+4y+1$								
12	$x=\frac{1}{3}y^2+2y+3$								
13	$x=2y^2+6y+4$								
14	$x=\frac{1}{2}y^2+1\frac{1}{2}y+1$								
15	$x=\frac{1}{2}y^2+y+\frac{1}{2}$								
16	$x=4y^2-1$								
17	$x=2y^2+3y+1$								
18	$x=6y^2-y-1$								
19	$x=y^2+1$								
20	$x=y^2+6y+5$								

Circles

#	General Form	Standard Form	Center	Radius
1	$x^2+y^2+2x+6y-6=0$	$(x+1)^2+(y+3)^2 = 16$	(-1, -3)	4
2	$x^2+y^2+2x-10y-10=0$	$(x+1)^2+(y-5)^2 = 36$	(-1, 5)	6
3	$x^2+y^2-9=0$	$(x-0)^2+(y-0)^2 = 9$	(0, 0)	3
4	$x^2+y^2+3x-5y-\frac{1}{2}=0$	$(x+3/2)^2+(y-5/2)^2 = 9$	(-3/2, 5/2)	3
5	$x^2+y^2-10x+4y+20=0$	$(x-5)^2+(y+2)^2 = 9$	(5, -2)	3
6	$x^2+y^2-8x-10y+1=0$	$(x-4)^2+(y-5)^2 = 40$	(4, 5)	$2\sqrt{10} \doteq 6.3$
7	$x^2+y^2+x-8y+\frac{1}{4}=0$	$(x+1/2)^2 + (y-4)^2 = 16$	(-1/2, 4)	4
8	$-2y=x^2+5x+y^2+ 3 \frac{1}{4}$	$(x+5/2)^2+(y+1)^2 = 4$	(-5/2, -1)	2
9	$-y^2=x^2-16$	$x^2+ y^2 = 16$	(0, 0)	4
10	$2x^2+2y^2-8=0$	$x^2+ y^2 = 4$	(0, 0)	2

Ellipses

#	General Form	Standard Form	Direction	Center	a Same direction as ellipse	b opposite direction from “a”	c Same direction as “a”	Vertices	Foci
1	$9x^2+16y^2-144=0$	$\frac{x^2}{16} + \frac{y^2}{9} = 1$	Horiz	(0, 0)	4	3	$\sqrt{7} \doteq 2.6$	(4,0) (-4,0) (0,3) (0,-3)	(2.6,0) (-2.6, 0)
2	$9x^2+18x+4y^2+16y-11=0$	$\frac{(x+1)^2}{4} + \frac{(y+2)^2}{9} = 1$	Vert	(-1, -2)	3	2	$\sqrt{5} \doteq 2.2$	(-1, 1) (-1, -5) (-3, -2) (1, -2)	(-1, 0.2) (-1, -4.2)
3	$16x^2+25y^2-400=0$	$\frac{x^2}{25} + \frac{y^2}{16} = 1$	Horiz	(0, 0)	5	4	3	(5, 0) (-5, 0) (0, 4) (0, -4)	(3, 0) (-3, 0)
4	$4x^2+y^2-24x+4y+36=0$	$\frac{(x-3)^2}{1} + \frac{(y+2)^2}{4} = 1$	Vert	(3, -2)	2	1	$\sqrt{3} \doteq 1.7$	(3, 0) (3, -4) (2, -2) (4, -2)	(3, -3.7) (3, -0.3)
5	$16x^2+4y^2+48x-32y+36=0$	$\left(x+\frac{3}{2}\right)^2 + \frac{(y-4)^2}{16} = 1$	Vert	(-1.5, 4)	4	2	$2\sqrt{3} \doteq 3.5$	(-1.5, 8) (-1.5, 0) (-3.5, 4) (0.5, 4)	(-1.5, 7.5) (-1.5, 0.5)

6	$4x^2+25y^2+20x-150y+150=0$	$\frac{\left(x+\frac{5}{2}\right)^2}{25} + \frac{(y-3)^2}{4} = 1$	Horiz	(-2.5, 3)	5	2	$\sqrt{21} \doteq 4.6$	(-7.5, 3) (2.5, 3) (-2.5, 5) (-2.5, 1)	(-7.1, 3) (2.1, 3)
7	$x^2+4y^2-2x+8y+1=0$	$\frac{(x-1)^2}{4} + \frac{(y+1)^2}{1} = 1$	Horiz	(1, -1)	2	1	$\sqrt{3} \doteq 1.7$	(-1, -1) (3, -1) (1, 0) (1, -2)	(2.7, -1) (-0.7, -1)
8	$x^2+9y^2-10x+16=0$	$\frac{(x-5)^2}{9} + \frac{y^2}{1} = 1$	Horiz	(5, 0)	3	1	$2\sqrt{2} \doteq 2.8$	(8, 0) (2, 0) (5, 1) (5, -1)	(7.8, 0) (2.2, 0)
9	$9x^2+4y^2+36x+24y+36=0$	$\frac{(x+2)^2}{4} + \frac{(y+3)^2}{9} = 1$	Vert	(-2, -3)	3	2	$\sqrt{5} \doteq 2.2$	(-2, 0) (-2, -6) (0, -3) (-4, -3)	(-2, -5.2) (-2, -0.8)

Horiz = Horizontal

Vert = Vertical

Hyperbolas

#	General Form	Standard Form	Direction	Center	a Same direction as hyperbola	b opposite direction from “a”	c same direction as “a”	Vertices	Foci
1	$9x^2-4y^2+18x-16y-43=0$	$\frac{(x+1)^2}{4} - \frac{(y+2)^2}{9} = 1$	Horiz	(-1, -2)	2	3	$\sqrt{13} \doteq 3.6$	(-3, -2) (1, -2)	(-4.6, -2) (2.6, -2)
2	$4x^2-25y^2-100=0$	$\frac{x^2}{25} - \frac{y^2}{4} = 1$	Horiz	(0, 0)	5	2	$\sqrt{29} \doteq 5.4$	(-5, 0) (5, 0)	(-5.4, 0) (5.4, 0)
3	$4x^2-y^2-24x+4y+16=0$	$\frac{(x-3)^2}{4} - \frac{(y-2)^2}{16} = 1$	Horiz	(3, 2)	2	4	$2\sqrt{5} \doteq 4.5$	(1, 2) (5, 2)	(-1.5, 2) (7.5, 2)
4	$x^2-9y^2+4x+18y=14$	$\frac{(x+2)^2}{9} - \frac{(y-1)^2}{1} = 1$	Horiz	(-2, 1)	3	1	$\sqrt{10} \doteq 3.2$	(-5, 1) (1, 1)	(-5.2, 1) (1.2, 1)
5	$4x^2-y^2+12x-4y+1=0$	$\frac{\left(x+\frac{3}{2}\right)^2}{1} - \frac{(y+2)^2}{4} = 1$	Horiz	(-1.5, -2)	1	2	$\sqrt{5} \doteq 2.2$	(-2.5, -2) (-0.5, -2)	(-3.7, -2) (0.7, -2)
6	$2x^2-8y^2+8x-24y-18=0$	$\frac{(x+2)^2}{4} - \frac{\left(y+\frac{3}{2}\right)^2}{1} = 1$	Horiz	(-2, -1.5)	2	1	$\sqrt{5} \doteq 2.2$	(-4, -1.5) (0, -1.5)	(-4.2, -1.5) (0.2, -1.5)

7	$8x^2 - 2y^2 + 32x - 6y + 19 = 0$	$\frac{(x+2)^2}{1} - \frac{\left(y+\frac{3}{2}\right)^2}{4} = 1$	Horiz	(-2 , -1.5)	1	2	$\sqrt{5} \doteq 2.2$	(-3 , -1.5) (-1 , -1.5)	(-4.2 , -1.5) (0.2 , -1.5)
8	$x^2 - 4y^2 - 2x - 8y - 7 = 0$	$\frac{(x-1)^2}{4} - \frac{(y+1)^2}{1} = 1$	Horiz	(1 , -1)	2	1	$\sqrt{5} \doteq 2.2$	(-1 , -1) (3 , -1)	(-1.2 , -1) (3.2 , -1)
9	$9x^2 - 4y^2 + 36x - 24y - 36 = 0$	$\frac{(x+2)^2}{4} - \frac{(y+3)^2}{9} = 1$	Horiz	(-2 , -3)	2	3	$\sqrt{13} \doteq 3.6$	(-4 , -3) (0 , -3)	(-5.6 , -3) (1.6 , -3)

Horiz = Horizontal

Vert = Vertical