

Lesson 90 Objective: SWBAT classify conic sections.

Kickoff

Complete questions 5 and 6 on your homework sheet.

① $\frac{(y-4)^2}{25} - \frac{x^2}{39} = 1$ ② $\frac{x^2}{9} - \frac{y^2}{7} = 1$
 ③ $\frac{(y+3)^2}{9} - \frac{(x+2)^2}{16} = 1$ ④ $\frac{(x-2)^2}{64} - \frac{(y+4)^2}{81} = 1$
 ⑧ $\frac{(y+7)^2}{16} - \frac{(x+3)^2}{4} = 1$ ⑨ $\frac{(x-10)^2}{16} - \frac{(y+7)^2}{9} = 1$
 ⑩ $\frac{(y-10)^2}{16} - \frac{(x-1)^2}{15} = 1$

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5) Vertices: $(-5, 1)$ & $(-5, -7)$
 Foci: $(-5, -3 + \sqrt{97})$ & $(-5, -3 - \sqrt{97})$
 6.8 -12.8
 vertical
 C $(-5, -3)$
 $a^2 + b^2 = c^2$ $a = 4$
 $16 + b^2 = 97$ $b =$
 $b^2 = 81$ $c = \sqrt{97}$
 $\frac{(y+3)^2}{16} - \frac{(x+5)^2}{81} = 1$

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6) $9x^2 - 4y^2 - 90x + 32y - 163 = 0$
 $9x^2 - 90x - 4y^2 + 32y = 163$
 $9(x^2 - 10x) - 4(y^2 - 8y) = 163$
 $9(x-5)^2 - 4(y-4)^2 = \frac{163 + 180 - 64}{324} = \frac{324}{324}$
 $\frac{(x-5)^2}{36} - \frac{(y-4)^2}{81} = 1$
 Horizontal

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Classifying Conic Sections
 Directions: Sketch the graph of the conics and identify any vertices and foci.
 1) $y^2 - 8x = 0$ * horizontal
 $18x + 8x$
 $y^2 = 8x$ $y(0,0)$
 $4p = 8$
 $p = 2$
 2) $x^2 - 6x + 2y + 9 = 0$ Parabola
 $-2y - 9 = -2x - 9$
 $x^2 - 6x = -2y - 9$

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3) $\frac{(x-3)^2}{81} + \frac{(y-2)^2}{100} = 1$ Vertical
 Ellipse C $(3, 2)$
 $a = 10$
 $b = 9$
 $a^2 = b^2 + c^2$

4) $x^2 - 2y^2 - 4x = 0$ hyperbola

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5) Find the equation and sketch the graph of a parabola with a focus at $(8, -2)$ and the directrix at $x = 4$.

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Summary of Graphs:
 $Ax^2 + By^2 + Cx + Dy + E = 0$

$A = B \rightarrow$ circle	A or B is squared
$A \neq B \rightarrow$ ellipse	↓
* the same signs	parabola
$A \neq B \rightarrow$ hyperbola	NO squares
* diff signs	↓
	Linear

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Directions: State the conic section for each of the following.

- $3x^2 - 2y^2 + 4y - 3 = 0$
hyperbola
- $2y^2 - 3x + 2 = 0$
parabola
- $x^2 + 4y^2 - 3x - 3 = 0$
ELipse
- $x^2 + 2x + 2y - 1 = 0$
parabola
- $6x^2 + 6y^2 - 12 = 0$
circle
- $4x^2 - 9x + y - 5 = 0$
Parabola
- $2x^2 + 4y^2 - 4x + 12y = 0$
Ellipse
- $\frac{x^2}{4} - \frac{y^2}{2} = 1$
hyperbola

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- $(x - 2)^2 + y^2 = 9$
- $4x^2 - y^2 + 8x - 6y + 4 = 0$
- $\frac{x^2}{3} + \frac{(y-1)^2}{2} = 1$
- $x^2 + y^2 - 6x + 4y + 9 = 0$
- $x^2 - 6x + 16y + 21 = 0$
- $4x^2 - y^2 - 4x - 3 = 0$
- $y^2 - 4y - 4x = 0$
- $4x^2 + 3y^2 + 8x - 24y + 51 = 0$

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