

Algebra II Pre-AP -- Assignment 51
Parabolas and Equations of Conics

For #1 - 7, graph each parabola using the latus rectum.
State the vertex, directrix, focus, and equation of the axis of symmetry.

| A Problems (Required) | B Problems (for additional practice) |
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| 1) $y^2 = 8x$ | 1) $y^2 = 6x$ |
| 2) $(y - 3)^2 = -12(x - 2)$ | 2) $(y + 1)^2 = -8(x - 3)$ |
| 3) $(x + 2)^2 = -2(y + 1)$ | 3) $(x - 1)^2 = -10(y - 4)$ |
| 4) $x^2 - 6x - 10y - 1 = 0$ | 4) $x^2 - 2x - 4y + 7 = 0$ |
| 5) $y^2 - 12x - 2y + 19 = 0$ | 5) $y^2 - 8x + 6y + 17 = 0$ |
| 6) $x^2 + 4x + 4y - 6 = 0$ | 6) $x^2 + 10x + 2y + 19 = 0$ |
| 7) $y^2 + 8x - 8y - 4 = 0$ | 7) $y^2 + 6x + 8y + 4 = 0$ |

For #8 - 12, find the equation of each parabola described.

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| 8) Directrix $y = 2$, vertex $(2,4)$ | 8) Vertex $(2,-1)$, directrix $y = -4$ |
| 9) Focus $(-3,-1)$, vertex $(1,-1)$ | 9) Vertex $(3,5)$, focus $(3,1)$ |
| 10) The set of points equidistant from $(1,-2)$ and the line $x = -3$. | 10) The set of points equidistant from $(1,2)$ and the line $x = -\frac{3}{2}$ |
| 11) Focus $(-2,1)$, vertex $(-2, -\frac{1}{2})$ | 11) Focus $(-2,1)$, vertex $(-4,1)$ |
| 12) Focus $(-3,1)$, directrix $x = -7$ | 12) Focus $(0,0)$, directrix $x = -4$ |

For #13 - 19, write the equation of each conic described, using standard form.

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| 13) Ellipse with foci $(-5,1)$ and $(3,1)$ and sum of focal radii is 16 | 13) Ellipse with foci $(-3,-2)$ and $(-3,4)$ and sum of focal radii is 8 |
| 14) Hyperbola with foci $(-5,3)$ and $(9,3)$ and difference of focal radii is 6. | 14) Hyperbola with foci $(3,-8)$ and $(3,-2)$ and difference of focal radii is 4. |
| 15) Parabola with directrix $x = 3$ and vertex $(2,1)$ | 15) Parabola with directrix $y = \frac{1}{2}$ and vertex $(3,-1)$ |
| 16) Ellipse with center $(-4,7)$, vertex $(-4,-3)$, and focus $(-4,0)$. | 16) Ellipse with major axis of length 10 and foci $(-3,-2)$ and $(-3,6)$. |
| 17) Circle with a diameter whose endpoints are $(3,-4)$ and $(-7,6)$. | 17) Circle with a diameter whose endpoints are $(1,-10)$ and $(-9,4)$. |
| 18) Hyperbola with vertices $(-2,3)$ and $(-2,-5)$ and with one focus $(-2,-7)$. | 18) Hyperbola with vertices $(3,-2)$ and $(-5,-2)$ and with one focus $(-7,-2)$. |
| 19) Ellipse with foci $(-3,4)$ and $(9,4)$ and length of major axis 14. | 19) Hyperbola with foci $(0,-2)$ and $(8,-2)$ and difference of focal radii 2. |