Homework #76 **Answers**

From Houghton-Mifflin Precalculus 3rd Edition

p720:

14) $\frac{(y-1)^2}{\frac{1}{4}} - \frac{(x+3)^2}{1/16} = 1$ center: (-3, 1), vertical,
$a = \frac{1}{2}$, $b = \frac{1}{4}$,
$c^2 = \frac{1}{4} + 1/16 = 5/16$, $c = \sqrt{5}/4$, vertices: (-3, 0.5), (-3, 1.5),
foci: $(-3, 1 - \sqrt{5}/4)$, $(-3, 1 + \sqrt{5}/4)$, asymptotes: $y = 1 \pm 2(x + 3)$

15) $9x^2 - y^2 - 36x - 6y + 18 = 0$

$9x^2 - 36x - y^2 - 6y = -18$

$9(x^2 - 4x) - (y^2 + 6y) = -18$

$9(x^2 - 4x + 4) - (y^2 + 6y + 9) = -18 + 36 - 9$

$9(x - 2)^2 - (y + 3)^2 = 9$

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

center: (2, -3), horizontal, $a = 1$, $b = 3$, $c^2 = 1 + 9 = 10$, $c = \sqrt{10}$,
vertices: (1, -3), (3, -3), foci: $(2 - \sqrt{10}, -3)$, $(2 + \sqrt{10}, -3)$,
asymptotes: $y = -3 + -3(x - 2)$

16) $x^2 - 9y^2 + 36y - 72 = 0$

$x^2 - 9(y^2 - 4y) = 72$

$x^2 - 9(y^2 - 4y + 4) = 72 - 36$

$x^2 - 9(y - 2)^2 = 36$

$\frac{x^2}{36} - \frac{(y-2)^2}{4} = 1$

center: (0, 2), horizontal, $a = 6$, $b = 2$, $c^2 = 36 + 4 = 40$, $c = 2\sqrt{10}$,
vertices: (-6, 2), (6, 2), foci: $(-2\sqrt{10}, 2)$, $(2\sqrt{10}, 2)$,
asymptotes: $y = 2 \pm (1/3)x$

p721:

47) $y^2 - 4y - 4x = 0$: parabola

48) $4x^2 + 3y^2 + 8x - 24y + 51 = 0$: ellipse

49) $4y^2 - 2x^2 - 4y - 8x - 15 = 0$: hyperbola

50) $25x^2 - 10x - 200y - 119 = 0$: parabola

51) $4x^2 + 4y^2 - 16y + 15 = 0$: circle