Worksheet #80 **Answers**

For use with Houghton-Mifflin Precalculus 3rd Edition

1) Line through (0, 0) and (5, -2): Let $(x_1, y_1) = (0, 0)$
$x = 0 + t(5 - 0)$, $y = 0 + t(-2 - 0)$ Or $x = 5t$, $y = -2t$

2) Line through (1, 4) and (5, -2): Let $(1, 4) = (x_1, y_1)$
$x = 1 + t(5 - 1)$, $y = 4 + t(-2 - 4)$ Or $x = 1 + 4t$, $y = 4 - 6t$

3) Circle: center: (2, 1), r = 4
$x = 2 + 4 \cos \theta$ $y = 1 + 4 \sin \theta$

4) Circle: center: (-3, 1), r = 3
$x = -3 + 3 \cos \theta$ $y = 1 + 3 \sin \theta$

5) Ellipse: vertices: (+-5, 0), foci: (+-4, 0)
(h, k) = (0, 0), horizontal, a = 5, c = 4, $16 = 25 - b^2$, $b^2 = 9$, b = 3
$x = 0 + 5 \cos \theta$, $y = 0 + 3 \sin \theta$ Or $x = 5 \cos \theta$, $y = 3 \sin \theta$

6) Ellipse: vertices: (4, 7), (4, -3), foci: (4, 5), (4, -1)
(h, k) = (4, 2), vertical, a = 5, c = 3, $9 = 25 - b^2$, $b^2 = 16$, b = 4
$x = 4 + 4 \cos \theta$, $y = 2 + 5 \sin \theta$

7) Hyperbola: vertices: (+-4, 0), foci: (+-5, 0)
(h, k) = (0, 0), horizontal, a = 4, c = 5, $25 = 16 + b^2$, $b^2 = 9$, b = 3
$x = 0 + 4 \sec \theta$, $y = 0 + 3 \tan \theta$ Or $x = 4 \sec \theta$, $y = 3 \tan \theta$

8) hyperbola: vertices: (0, +-1), foci: (0, +-5)
(h, k) = (0, 0), vertical, a = 1, c = 5, $25 = 1 + b^2$, $b^2 = 24$, $b = 2\sqrt{6}$
$x = 0 + 1 \tan \theta$, $y = 0 + 2\sqrt{6} \sec \theta$ Or $x = \tan \theta$, $y = 2\sqrt{6} \sec \theta$