1. Find an equation for the line that passes through the point (2, -5) and
   (a) has slope -3
   (b) is parallel to the x-axis
   (c) is parallel to the y-axis
   (d) is parallel to the line $2x - 4y = 3$

2. Find an equation for the circle that has center (-1, 4) and passes through the point (3, -2).

3. Find the center and radius of the circle with equation $x^2 + y^2 - 6x + 10y + 9 = 0$.

4. Let $A(-7, 4)$ and $B(5, -12)$ be points in the plane.
   (a) Find the slope of the line that contains $A$ and $B$.
   (b) Find an equation of the line that passes through $A$ and $B$. What are the intercepts?
   (c) Find the midpoint of the segment $AB$.
   (d) Find the length of the segment $AB$.
   (e) Find an equation of the perpendicular bisector of $AB$.
   (f) Find an equation of the circle for which $AB$ is a diameter.

5. Sketch the region in the $xy$-plane defined by the equation or inequalities.
   (a) $-1 \leq y \leq 3$
   (b) $|x| < 4$ and $|y| < 2$
   (c) $y < 1 - \frac{1}{2}x$
   (d) $y \geq x^2 - 1$
   (e) $x^2 + y^2 < 4$
   (f) $9x^2 + 16y^2 = 144$

ANSWERS TO DIAGNOSTIC TEST B: ANALYTIC GEOMETRY

1. (a) $y = -3x + 1$
   (b) $y = -5$
   (c) $x = 2$
   (d) $y = \frac{1}{2}x - 6$

2. $(x + 1)^2 + (y - 4)^2 = 52$

3. Center (3, -5), radius 5

4. (a) $-\frac{1}{2}$
   (b) $4x + 3y + 16 = 0$; x-intercept -4, y-intercept $-\frac{16}{3}$
   (c) (-1, -4)
   (d) 20
   (e) $3x - 4y = 13$
   (f) $(x + 1)^2 + (y + 4)^2 = 100$

5. (a) (b) (c) (d) (e) (f)

If you have had difficulty with these problems, you may wish to consult the Review of Analytic Geometry on the website www.stewartcalculus.com.