

## 7-6

NAME \_\_\_\_\_ DATE \_\_\_\_\_ PERIOD \_\_\_\_\_

## Practice

## Normal Form of a Linear Equation

Write the standard form of the equation of each line, given  $p$ , the length of the normal segment, and  $\phi$ , the angle the normal segment makes with the positive  $x$ -axis.

1.  $p = 4, \phi = 30^\circ$

$$\sqrt{3}x + y - 8 = 0$$

2.  $p = 2\sqrt{2}, \phi = \frac{\pi}{4}$

$$x + y - 4 = 0$$

3.  $p = 3, \phi = 60^\circ$

$$x + \sqrt{3}y - 6 = 0$$

4.  $p = 8, \phi = \frac{5\pi}{6}$

$$\sqrt{3}x - y + 16 = 0$$

5.  $p = 2\sqrt{3}, \phi = \frac{7\pi}{4}$

$$\sqrt{2}x - \sqrt{2}y - 4\sqrt{3} = 0$$

6.  $p = 15, \phi = 225^\circ$

$$\sqrt{2}x + \sqrt{2}y + 30 = 0$$

Write each equation in normal form. Then find the length of the normal and the angle it makes with the positive  $x$ -axis.

7.  $3x - 2y - 1 = 0$

$$\frac{3\sqrt{13}}{13}x - \frac{2\sqrt{13}}{13}y - \frac{\sqrt{13}}{13} = 0; \frac{\sqrt{13}}{13}; 326^\circ$$

8.  $5x + y - 12 = 0$

$$\frac{5\sqrt{26}}{26}x + \frac{\sqrt{26}}{26}y - \frac{6\sqrt{26}}{13} = 0; \frac{6\sqrt{26}}{13}; 11^\circ$$

9.  $4x + 3y - 4 = 0$

$$\frac{4}{5}x + \frac{3}{5}y - \frac{4}{5} = 0; \frac{4}{5}; 37^\circ$$

10.  $y = x + 5$

$$-\frac{\sqrt{2}}{2}x + \frac{\sqrt{2}}{2}y - \frac{5\sqrt{2}}{2} = 0; \frac{5\sqrt{2}}{2}; 135^\circ$$

11.  $2x + y + 1 = 0$

$$-\frac{2\sqrt{5}}{5}x - \frac{\sqrt{5}}{5}y - \frac{\sqrt{5}}{5} = 0; \frac{\sqrt{5}}{5}; 207^\circ$$

12.  $x + y - 5 = 0$

$$\frac{\sqrt{2}}{2}x + \frac{\sqrt{2}}{2}y - \frac{5\sqrt{2}}{2} = 0; \frac{5\sqrt{2}}{2}; 45^\circ$$