NAME _____ DATE _____ PERIOD _____

8-6

Practice

Vectors and Parametric Equations

Write a vector equation of the line that passes through point P and is parallel to $\vec{a}$. Then write parametric equations of the line.

1. $P(-2, 1)$, $\vec{\mathbf{a}} = \langle 3, -4 \rangle$

$\langle x + 2, y - 1 \rangle = t\langle 3, -4 \rangle$
$x = -2 + 3t$
$y = 1 - 4t$

2. $P(3, 7)$, $\vec{\mathbf{a}} = \langle 4, 5 \rangle$

$\langle x - 3, y - 7 \rangle = t\langle 4, 5 \rangle$
$x = 3 + 4t$
$y = 7 + 5t$

3. $P(2, -4)$, $\vec{\mathbf{a}} = \langle 1, 3 \rangle$

$\langle x - 2, y + 4 \rangle = t\langle 1, 3 \rangle$
$x = 2 + t$
$y = -4 + 3t$

4. $P(5, -8)$, $\vec{\mathbf{a}} = \langle 9, 2 \rangle$

$\langle x - 5, y + 8 \rangle = t\langle 9, 2 \rangle$
$x = 5 + 9t$
$y = -8 + 2t$

Write parametric equations of the line with the given equation.

5. $y = 3x - 8$

$x = t$
$y = 3t - 8$

6. $y = -x + 4$

$x = t$
$y = -t + 4$

7. $3x - 2y = 6$

$x = t$
$y = \frac{3}{2}t - 3$

8. $5x + 4y = 20$

$x = t$
$y = -\frac{5}{4}t + 5$

Write an equation in slope-intercept form of the line with the given parametric equations.

9. $x = 2t + 3$
$y = t - 4$

$y = \frac{1}{2}x - \frac{11}{2}$

10. $x = t + 5$
$y = -3t$

$y = -3x + 15$

11. ***Physical Education*** Brett and Chad are playing touch football in gym class. Brett has to tag Chad before he reaches a 20-yard marker. Chad follows a path defined by $\langle x - 1, y - 19 \rangle = t\langle 0, 1 \rangle$, and Brett follows a path defined by $\langle x - 12, y - 0 \rangle = t\langle -11, 19 \rangle$. Write parametric equations for the paths of Brett and Chad. Will Brett tag Chad before he reaches the 20-yard marker?

Chad $x = 1$, $y = 19 + t$; Brett $x = 12 - 11t$, $y = 19t$; yes