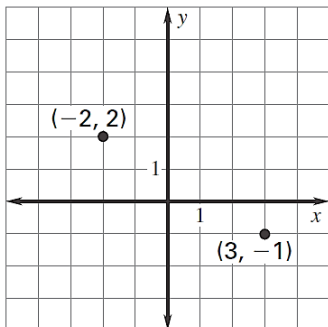**Parallel and Perpendicular Lines**
Show all work!!

Name_____
Date_____Period_____

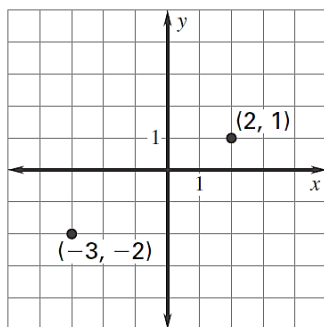**Calculate the slope of the line that passes through the labeled points on the graph.**

1.

$(-2, 2)$
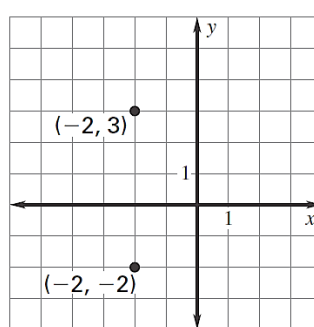$(3, -1)$

$m = -\dfrac{3}{5}$

2.

$(2, 1)$
$(-3, -2)$

$m = \dfrac{3}{5}$

3.

$(-2, 3)$
$(-2, -2)$

$m = \text{undefined}$

Find the slope of each line. Are the lines parallel?

4.

B
A
D
C

$m = \dfrac{2}{5}$
$m = \dfrac{2}{5}$
yes

5.

B
D

m=-6
m=-3
no

6.

A
C
B
D
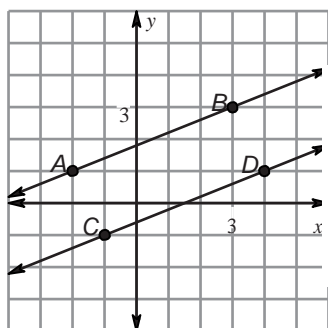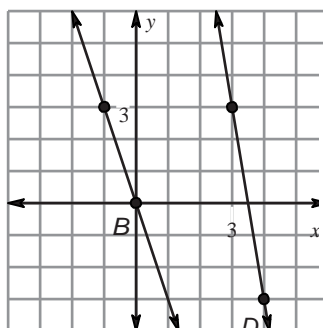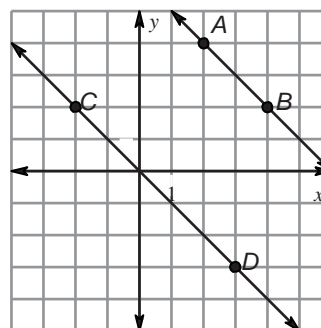
m=-1
m=-1
yes

Write an equation of the line.

7. slope = 2

y-intercept = -3

$y = 2x - 3$

8. parallel to $y = -3x$

y-intercept = $\dfrac{1}{3}$

$y = -3x + \dfrac{1}{3}$

9. parallel to $y = \dfrac{1}{2}x - 3$

y-intercept = 6

$y = \dfrac{1}{2}x + 6$

Write an equation of the line that passes through the given point *P* and has the given slope.

10. $P(0, 5)$, slope = 2

$y = 2x + 5$

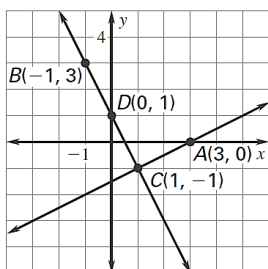11. $P(5, 6)$, slope $= \dfrac{4}{5}$

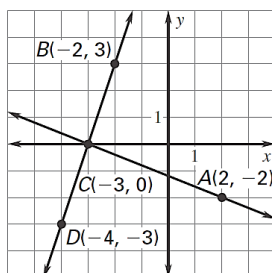$y = \dfrac{4}{5}x + 2$

12. $P(-4, -2)$, slope $= -1$

$y = -x - 6$

Find the slope of $\overleftrightarrow{AC}$ and $\overleftrightarrow{BD}$. Decide whether $\overleftrightarrow{AC}$ is perpendicular to $\overleftrightarrow{BD}$.
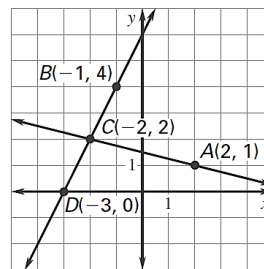
1.

$m=\frac{1}{2}$
$m=-2$
yes

2.

$m=-\frac{2}{5}$
$m=3$
no

3.

$m=-\frac{1}{4}$
$m=2$
no

The slopes of two lines are given. Are the lines perpendicular?

4. $m_1 = 3, m_2 = \frac{1}{3}$ no

5. $m_1 = -\frac{4}{3}, m_2 = \frac{4}{3}$ no

6. $m_1 = -2, m_2 = \frac{1}{2}$ yes

7. $m_1 = -\frac{2}{5}, m_2 = \frac{5}{2}$ yes

8. $m_1 = 3\frac{1}{2}, m_2 = -\frac{2}{7}$ yes

9. $m_1 = 3, m_2 = -3$ no

Decide whether lines p_1 and p_2 are perpendicular.

10. line p_1: $y = 2x + 5$ no
line p_2: $y = \frac{1}{2}x + 5$

11. line p_1: $6x + 8y = 12$ no
line p_2: $6x - 8y = 18$

12. line p_1: $9x - 7y = 6$ yes
line p_2: $7x + 9y = -5$

13. line p_1: $x + 2y = -4$ yes
line p_2: $6x - 3y = 8$

Determine if the intersection of $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ forms a right angle. Explain your reasoning.

14. $A(-9, 2), B(0, 1), C(-1, 8), D(-2, -1)$

Yes slopes are 9 and $-\frac{1}{9}$

15. $A(3, 6), B(-1, 4), C(4, 0), D(0, 8)$

Yes slopes are -2 and $\frac{1}{2}$

Line *j* is perpendicular to the line with the given equation and line *j* passes through *P*. Write an equation of line *j*.

16. $y = \frac{2}{7}x + 4, P(2, 3)$

$y = -\frac{7}{2}x + 10$

17. $y = -4x + 7, P(4, 2)$

$y = \frac{1}{4}x + 1$

Write an equation parallel to the given line. Write an equation perpendicular to the given line.

18. $y = -5x$

$y = -5x + 1, y = \frac{1}{5}x$

19. $y = \frac{1}{3}x - 1$

$y = \frac{1}{3}x + 5, y = -3x + 5$

20. $2x - 4y = 3$

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

These are just possibilities. Your answer is correct as long and the first one has the same slope and the second one has a slope that is the opposite reciprocal.