Algebra 1

Parallel and Perpendicular Worksheet

Name Key

$y - y_1 = m(x - x_1)$

Write in point-slope form the equation of the line that is parallel to the given line and passes through the given point. Your final answer should be in slope-intercept form.

1. $y = x + 5$, (-1, -1)

m = 1

point (-1, -1)

point-slope: $y + 1 = 1(x + 1)$

$y + 1 = x + 1$

$y = x$

final: $y = x$

2. $y = -3x + 1$, (2, 4)

m = -3

point (2, 4)

point-slope: $y - 4 = -3(x - 2)$

$y - 4 = -3x + 6$

$y = -3x + 10$

final: $y = -3x + 10$

3. $y = \frac{1}{4}x - 6$, (3, 3)

m = $\frac{1}{4}$

point (3, 3)

point-slope: $y - 3 = \frac{1}{4}(x - 3)$

$y - 3 = \frac{1}{4}x - \frac{3}{4}$

$y = \frac{1}{4}x - \frac{3}{4} + 3$

final: $y = \frac{1}{4}x + 2\frac{1}{4}$

4. $y = 2x - 11$, (3, 4)

m = 2

point (3, 4)

point-slope: $y - 4 = 2(x - 3)$

$y - 4 = 2x - 6$

final: $y = 2x + \bar{2}$

5. $y = \frac{1}{2}x$, (8, -10)

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

point (8, -10)

point-slope: $y + 10 = \frac{1}{2}(x - 8)$

$y + 10 = \frac{1}{2}x - 4$

final: $y = \frac{1}{2}x + \bar{1}4$

6. $y = \frac{1}{3}x + 4$, (-4, -4)

m = $\frac{1}{3}$

point (-4, -4)

point-slope: $y + 4 = \frac{1}{3}(x + 4)$

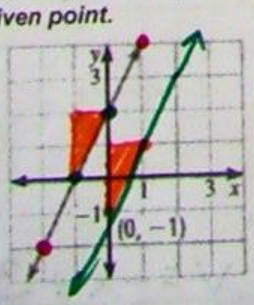
$y + 4 = \frac{1}{3}x + \frac{4}{3}$

$y = \frac{1}{3}x + 1\frac{1}{3} - 4$

final: $y = \frac{1}{3}x - 2\frac{2}{3}$

Write in slope-intercept form the equation of the line that is parallel to the line in the graph and passes through the given point.

7.



m = 2 point (0, -1)

point-slope: $y + 1 = 2(x - 0)$

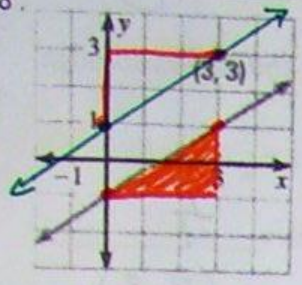
$y + 1 = 2x - 0$

$y = 2x - 1$

final: $y = 2x - 1$ (graph this equation)

Write in slope-intercept form the equation of the line that is parallel to the line in the graph and passes through the given point. Graph the new line.

8.



m = $\frac{2}{3}$

point (3, 3)

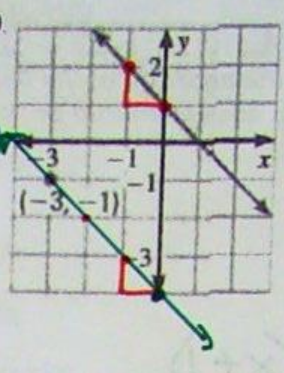
point-slope: $y-3=\frac{2}{3}(x-3)$

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

$y=\frac{2}{3}x+1$

final: $y=\frac{2}{3}x+1$ (graph this equation)

9.



m = -1

point $(-3,-1)$

point-slope: $y+1=-1(x+$

$y+1=-x+-3$

$y=-x+-4$

final: $y=-x+-4$ (graph this equation)

10. What is the slope-intercept form of the equation of the line parallel to the line in the graph that passes through the point (-1, 1)? After completing the work, circle your final answer and graph it on the grid.

A. $y=2x-3$

B. $y-3=2(x-1)$

C. $y=-2x+3$

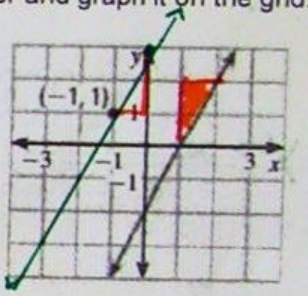
(D.) $y=2x+3$

$m=2 \quad (-1,1)$

$y-1=2(x+1)$

$y-1=2x+2$

$y=2x+3$



Use point-slope form to write an equation in slope-intercept form of the line that is perpendicular to the given line and passes through the given point.

11. $y=3x-1$, (1, -3)

$\perp m = -\frac{1}{3}$

point $(1,-3)$

point-slope: $y+3=-\frac{1}{3}(x-1)$

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

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

final: $y=-\frac{1}{3}x+-2\frac{2}{3}$

12. $y=-\frac{1}{2}x+4$, (8, 5)

$\perp m = 2$

point $(8,5)$

point-slope: $y-5=2(x-8)$

$y-5=2x-16$

$y=2x-11$

final: $y=2x+-11$

13. $y=x+2$, (3, 0)

$\perp m = -1$

point $(3,0)$

point-slope: $y-0=-1(x-3)$

$y=-x+3$

final: $y=-x+3$

14. $y = \frac{7}{8}x$, (0, 3)

⊥m = $-\frac{8}{7}$

point (0, 3)

point-slope: $y - 3 = -\frac{8}{7}(x - 0)$

$y - 3 = -\frac{8}{7}x$

$y = -\frac{8}{7}x + 3$

final: $y = -\frac{8}{7}x + 3$

15. $y = -\frac{2}{3}x + 4$, (-4, 6)

⊥m = $\frac{3}{2}$

point (-4, 6)

point-slope: $y - 6 = \frac{3}{2}(x + 4)$

$y - 6 = \frac{3}{2}x + 6$

$y = \frac{3}{2}x + 12$

final: $y = \frac{3}{2}x + 12$

16. $y = -2x + 8$, (-3, 1)

⊥m = $\frac{1}{2}$

point (-3, 1)

point-slope: $y - 1 = \frac{1}{2}(x + 3)$

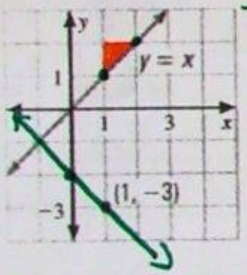
$y - 1 = \frac{1}{2}x + \frac{3}{2}$

$y = \frac{1}{2}x + 1\frac{1}{2} + 1$

final: $y = \frac{1}{2}x + 2\frac{1}{2}$

Write in slope-intercept form the equation of the line that is perpendicular to the line in the graph and passes through the given point.

17.



⊥m = -1

point (1, −3)

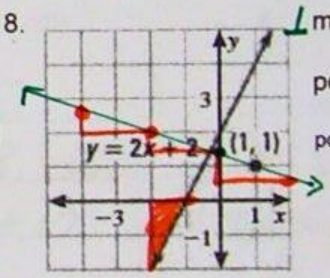
point-slope: $y + 3 = -1(x - 1)$

$y + 3 = -x + 1$

final: $y = -x + -2$

(graph this equation)

18.



⊥m = $-\frac{1}{2}$

point (1, 1)

point-slope: $y - 1 = -\frac{1}{2}(x - 1)$

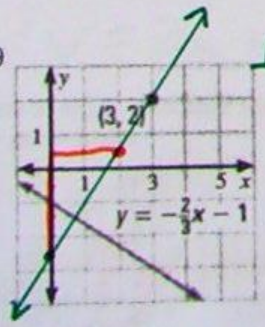
$y - 1 = -\frac{1}{2}x + \frac{1}{2}$

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

final: $y = -\frac{1}{2}x + 1\frac{1}{2}$

(graph this equation)

19



⊥m = $\frac{3}{2}$

point (3, 2)

point-slope: $y - 2 = \frac{3}{2}(x - 3)$

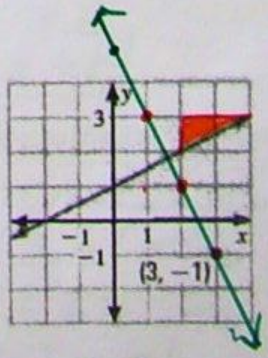
$y - 2 = \frac{3}{2}x - \frac{9}{2}$

$y = \frac{3}{2}x - 4\frac{1}{2} + 2$

final: $y = \frac{3}{2}x - 2\frac{1}{2}$

(graph this equation)

20.



m = -2

point (3, −1)

point-slope: $y + 1 = -2(x - 3)$

$y + 1 = -2x + 6$

$y = -2x + 5$

final: $y = -2x + 5$

(graph this equation)