

Aim: How do you write the equation of parallel and perpendicular lines?

Warm Up Question: What is the slope of a line that is parallel to $y=2x-3$?

NOTES ---

How do you determine the slope of a line that is parallel? slope of // lines are equal

How do you determine the slope of a line that is perpendicular? $\perp m \rightarrow$ use neg. (or opposite) reciprocal

What is the slope of a line that is perpendicular to $y=2x-3$? $\perp m = -1/2$

What is the slope of a line that is perpendicular to $y=-3/2x+7$? $\perp m = 3/2$

Find an equation for the line:

1 through (2, 3) and parallel to $y = \frac{1}{3}x - 2$. $m = \frac{1}{3}$

$$y = mx + b$$

$$3 \cdot (3 = \frac{1}{3}(2) + b)$$

$$9 = 2 + 3b$$

$$7 = 3b$$

$$b = \frac{7}{3}$$

Equation of Line: $y = \frac{1}{3}x + \frac{7}{3}$

2 through (1, -7) and parallel to $y = -2x - 3$. $m = -2$

$$y = mx + b$$

$$-7 = (-2)(1) + b$$

$$-7 = -2 + b$$

$$-5 = b$$

Equation of Line: $y = -2x - 5$

3 through (-2, 8) and parallel to $y = -\frac{1}{3}x - 4$. $m = -1/3$

$$y = mx + b$$

$$3 \cdot [8 = -\frac{1}{3}(-2) + b]$$

$$24 = 2 + 3b$$

$$22 = 3b$$

$$b = \frac{22}{3}$$

Equation of Line: $y = -\frac{1}{3}x + \frac{22}{3}$

4 through (7, -3) and perpendicular to $y = -\frac{1}{4}x - 2$. $m = -1/4$

$$\perp m = 4$$

$$y = mx + b$$

$$-3 = 4(7) + b$$

$$-3 = 28 + b$$

$$b = -31$$

Equation of Line: $y = 4x - 31$

5 through (2, -6) and perpendicular to $y = -\frac{3}{4}x - 1$. $m = -3/4$

$$\perp m = 4/3$$

$$y = mx + b$$

$$3 [-6 = \frac{4}{3}(2) + b]$$

$$-18 = 8 + 3b$$

$$-26 = 3b$$

$$b = -\frac{26}{3}$$

Equation of Line: $y = \frac{4}{3}x - \frac{26}{3}$

6 through (3, -1) and perpendicular to $y = -\frac{3}{2}x - 4$. $m = -3/2$

$$\perp m = 2/3$$

$$y = mx + b$$

$$-1 = \frac{2}{3}(3) + b$$

$$-1 = 2 + b$$

$$b = -3$$

Equation of Line: $y = \frac{2}{3}x - 3$

What Did the Policeman Tell The Burglar in the Bathroom?

Find the answer for each exercise in the adjacent answer columns. Write the letter of the exercise in the box containing the number of the answer.

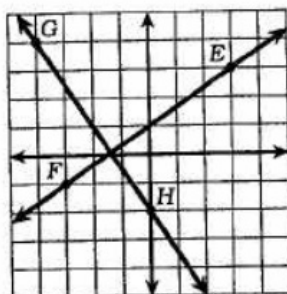
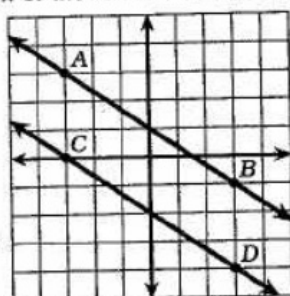
Part 1. Write the equation of the line indicated.

U Equation of \overleftrightarrow{AB}

O Equation of \overleftrightarrow{CD}

I Equation of \overleftrightarrow{EF}

S Equation of \overleftrightarrow{GH}



Part 1 Answers

11 $y = \frac{2}{3}x + 1$

17 $y = -\frac{2}{3}x + 1$

24 $y = -\frac{3}{2}x - 2$

20 $y = -\frac{3}{2}x + 1$

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

Part 2. Write the slope of a line parallel to the given line.

T $y = \frac{7}{4}x - 2$

U $y = 8 - 3x$

18 $\frac{12}{5}$

8 $\frac{7}{4}$

10 $-\frac{7}{4}$

O $-5x + y = 12$

A $4x + 7y = 21$

6 5

21 $-\frac{4}{7}$

26 -3

Part 3. Write the slope of a line perpendicular to the given line.

E $y = -\frac{5}{4}x + 1$

H $y = 6x + 11$

3 $\frac{5}{4}$

23 $-\frac{3}{8}$

13 $-\frac{1}{6}$

O $2x + 5y = 40$

T $8x - 3y = 15$

16 $\frac{5}{2}$

4 $\frac{4}{5}$

15 $-\frac{8}{3}$

Part 4. Write an equation for the line that is parallel to the given line and that contains the given point.

W $y = 3x - 4; (2, 7)$

1 $y = -4x + 1$

18 $y = \frac{5}{3}x - 3$

Y $y = -\frac{1}{2}x + 5; (4, -5)$

12 $y = -\frac{1}{2}x - 1$

10 $y = 3x + 1$

C $4x + y = -9; (-2, 9)$

9 $y = -x + 2$

19 $y = -4x - 7$

R $-5x + 3y = 6; (-3, -8)$

15 $y = -\frac{1}{2}x - 3$

27 $y = -x - 4$

P $x + y = 7; (-4, 0)$

7 $y = 3x - 2$

14 $y = \frac{5}{3}x - 8$

Part 5. Write an equation for the line that is perpendicular to the given line and that contains the given point.

U $y = -\frac{1}{3}x + 4; (2, 5)$

14 $y = -\frac{5}{2}x + 7$

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

T $y = \frac{2}{5}x - 3; (2, -3)$

20 $y = -4x - 5$

25 $y = 3x - 5$

P $y = \frac{x}{4} + 15; (-3, 7)$

9 $y = -\frac{1}{5}x + 5$

12 $y = -\frac{5}{2}x + 2$

M $3x + 2y = -10; (-9, -2)$

19 $y = -4x - 3$

7 $y = 3x - 1$

N $5x - y = 16; (0, 0)$

22 $y = -\frac{1}{5}x$

5 $y = \frac{2}{3}x + 6$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
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