Model Problem 1)
What is the equation for the line that passes through the points (3, 4) and (5,8)?

Model Problem 2)
What is an equation for the line that passes through the coordinates (4,5) and (8, 3)?

Model Problem 3)
What is the equation for the line that passes through the coordinates (1,2) and (5, 10) ?

ANSWER TO MODEL PROBLEM 1

Model Problem 1
What is the equation for the line that passes through the points (3, 4) and (5,8)?

Steps to solve these problems:

1) Calculate Slope

$$\frac{8-4}{5-3}=\frac{4}{2}=2$$

2) Plug it into the slope intercept formula: $y = mx + b$

$y= \mathbf{2}x + b$

3) Plug the x and y given in the question into the point slope formula

$y= \mathbf{2}x + b$

$4= \mathbf{2}(3) + b$

4) Solve for b

$4 = 6 + b$

$4 = 6 + b$

$-6 \quad -6$

$-2 = b$

5) Rewrite equation with only slope and y-intercept

$y = 2x - 2$

ANSWER TO MODEL PROBLEM 2

Model Problem 2)
What is an equation for the line that passes through the coordinates (4,5) and (8, 3)?

1) Calculate Slope

$$\frac{5-3}{4-8}=\frac{2}{-4}=-\frac{1}{2}$$

2) Plug it into the slope intercept formula: $y=-\frac{1}{2}x+b$

3) Plug the x and y given in the question into the point slope formula

$$5=-\frac{1}{2}(4)+b$$

4) Solve for b

$$5=-\frac{1}{2}(4)+b$$

$$5 = -2+b$$

$$\begin{array}{r} +2 \quad +2 \\ \hline 7=b \end{array}$$

5) Rewrite equation with only slope and y-intercept

$$y=-\frac{1}{2}x+7$$

ANSWER TO MODEL PROBLEM 3

Model Problem 3) What is the equation for the line that passes through the coordinates (1,2) and (5, 10)?

1) Calculate Slope $\frac{10-2}{5-1}=\frac{8}{4}=2$

2) Plug it into the slope intercept formula: $y = 2x + b$

3) Plug the x and y given in the question into the point slope formula

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

4) Solve for b

$$\begin{array}{r} 2 = 2+b \\ -2 \quad -2 \\ \hline 0 = b \end{array}$$

5) Rewrite equation with only slope and y-intercept

$y = 2x + 0$

Or

$y = 2x$

Practice Problems

1) What is an equation for the line that passes through the coordinates (2,7) and (0, 1)?

2) What is an equation for the line that passes through the coordinates (2,0) and (0,3) ?

3) What is an equation for the line that passes through the coordinates (-1,2) and (7,6) ?

4) Find the equation of the line that passes through the points (1,1) and (3,5)?

5) Find the equation of the line that passes through the points (1,3) and (2,4) ?

6) Find the equation of the line that passes through the points (2, 6) and (-2, 4) ?

7) Find the equation of a line that passes through the points (2, 16) and (-1, 7).

8) Find the equation of a line that passes through the points (2,13) and (1,8)

9) Find the equation of a line that passes through the points (4, 3) and (8,1)

Challenge Questions

10) Find the equation of a line that passes through the points (2, 5) and (2, 12).

11) Find the equation of a line that passes through the points (5, 3) and (2, 3).

Practice Problem Answers

1) What is an equation for the line that passes through the coordinates (2,7) and (0, 1)?

Answer : $y = 3x + 1$

2) What is an equation for the line that passes through the coordinates (2,0) and (0,3) ?

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

3) What is an equation for the line that passes through the coordinates (-1,2) and (7,6) ?

Answer : $y = \frac{1}{2}x + 2.5$

4) What is an equation for the line that passethat passes through the points (1,1) and (3,5)?

Answer : $y = 2x - 1$

5) Find the equation of the line that passes through the points (1,3) and (2,4) ?

Answer : $y = 1x + 2$ or $y = x + 2$

6) Find the equation of the line that passes through the points (2, 6) and (-2, 4) ?

Answer : $y = \frac{1}{2}x + 5$

7) Find the equation of a line that passes through the points (2, 16) and (-1, 7).

Answer : $y = 3x + 10$

8) Find the equation of a line that passes through the points (2,13) and (1,8)

Answer : $y = 5x + 3$

9) Find the equation of a line that passes through the points (4, 3) and (8,1)

Answer : $y = -\frac{1}{2}x + 5$

Challenge Questions

10) Find the equation of a line that passes through the points (2, 5) and (2, 12).

Answer : $x = 2$. This is the equation of a vertical line whose slope is undefined.

11) Find the equation of a line that passes through the points (5, 3) and (2, 3).

Answer : $y = 3$. This is the equation of a horizontal line.