

Unit 4 Objective 6 Remediation

Write the equations of parallel and perpendicular lines

Slope-intercept Form: $y = mx + b$ where m is the slope of the line and b is the y-intercept.

Two lines are *parallel* if they have the exact same slope and different y-intercepts (i.e. if the slope of a line is 2, then the slope of a line parallel is also going to be 2).

Two lines are *perpendicular* if their slopes are opposite reciprocals of each other (i.e. if the slope of a line is $\frac{1}{2}$, the slope of a line perpendicular is going to be -2).

Examples:

Ex. A

Find the slope of a line parallel and perpendicular to the given line.

Given Line: $y = 3x + 2$

Parallel Slope: 3 Perpendicular Slope: $-\frac{1}{3}$

Ex. B

Find the equation of the line parallel and perpendicular to the given line and passes through the point (2, 3)

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

Parallel Line:

$$y = mx + b$$

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

$$3 = 1 + b$$

$$2 = b$$

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

Perpendicular Line:

$$y = mx + b$$

$$3 = -2(2) + b$$

$$3 = -4 + b$$

$$7 = b$$

$$y = -2x + 7$$

Try These:

Find the parallel and perpendicular slope of the given line.

1. $y = 3x - 7$

Parallel Slope: _____

Perpendicular Slope: _____

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

Parallel Slope: _____

Perpendicular Slope: _____

3. $y = -6x - 1$

Parallel Slope: _____

Perpendicular Slope: _____

4. $2x - 3y = 5$

Parallel Slope: _____

Perpendicular Slope: _____

5. $-5y + 2 = 3x$

Parallel Slope: _____

Perpendicular Slope: _____

Write the equation for a line parallel and perpendicular to the given line. Write your answers in slope-intercept form.

6. $y = \frac{2}{3}x + 3$ and passes through the point (3, 2)

Equation of Parallel Line: _____

Perpendicular Line: _____

7. $y = 3x - 2$ and passes through the point $(1, 2)$

Equation of Parallel Line: _____

Perpendicular Line: _____

8. $y = -2x - 7$ and passes through the point $(5, 0)$

Equation of Parallel Line: _____

Perpendicular Line: _____

9. $y = \frac{1}{2}x + 1$ and passes through $(4, 2)$

Equation of Parallel Line: _____

Perpendicular Line: _____

10. $y = -x + 3$ and passes through $(-2, 1)$

Equation of Parallel Line: _____

Perpendicular Line: _____