

8.0

1 CST item

Students understand the concepts of parallel lines and perpendicular lines and how those slopes are related. Students are able to find the equation of a line perpendicular to a given line that passes through a given point.

Key Vocabulary

Perpendicular
Coordinates

Parallel
Substitution

Slope
Linear Equation

Opposite-Reciprocal
Slope-Intercept Form

Instructional Objectives

1 Graph a line parallel to a given line, passing through a specified point.

- 1 Graph a line parallel to the y -axis that passes through the point $(4, 7)$.
- 2 Graph a line parallel to the x -axis that passes through the point $(-2, -8)$.
- 3 Graph a line parallel to the line $y = 3x - 6$ that passes through the point $(2, 9)$.
- 4 Graph a line parallel to the line $x - 2y = -10$ that passes through the point $(-6, 5)$.

2 Determine the equation of a line parallel to a given line, passing through a specified point (either by graphing or substitution).

- 1 What is the equation of the line parallel to the y -axis that passes through the point $(4, 7)$?
- 2 What is the equation of the line parallel to the x -axis that passes through the point $(-2, -8)$?
- 3 What is the equation of the line parallel to the line $y = 3x - 6$ that passes through the point $(2, 9)$?
- 4 What is the equation of the line parallel to the line $x - 2y = -10$ that passes through the point $(-6, 5)$?

3 Graph a line perpendicular to a given line, passing through a specified point.

- 1 Graph a line perpendicular to the y -axis that passes through the point $(5, -8)$.
- 2 Graph a line perpendicular to the line $y = 4x + 8$ that passes through the point $(4, -1)$.
- 3 Graph a line perpendicular to the line $y = -\frac{1}{2}x - 4$ that passes through the point $(8, 8)$.
- 4 Graph a line parallel to the line $3x - 2y = 12$ that passes through the point $(6, 4)$.

4 Determine the equation of a line perpendicular to a given line, passing through a specified point (either by graphing or substitution).

- 1 ▶ What is the equation of the line perpendicular to the y -axis that passes through the point $(5, -8)$?
- 2 ▶ What is the equation of the line perpendicular to the line $y = 4x + 8$ that passes through the point $(4, -1)$?
- 3 ▶ What is the equation of the line perpendicular to the line $y = -\frac{1}{2}x - 4$ that passes through the point $(8, 8)$?
- 4 ▶ What is the equation of the line parallel to the line $3x - 2y = 12$ that passes through the point $(6, 4)$?

NOTE: Standard 8.0 will be assessed on the STAR by only one question, which will most closely resemble those from this Instructional Objective (8.0.4), finding the equation of a line perpendicular to given line through a given point.

5 Determine whether the graphs of two linear equations will be parallel, perpendicular, or neither.

- 1 ▶ Are the graphs of $y = 3x - 8$ and $y = -\frac{1}{3}x + 6$ parallel, perpendicular, or neither?
- 2 ▶ Are the graphs of $3x - 2y = 6$ and $4y = 6x - 10$ parallel, perpendicular, or neither?
- 3 ▶ Which of the lines shown below on the graph are parallel?
- 4 ▶ Which of the lines shown below on the graph are perpendicular?

