Writing Equations of Lines

Concept Sheet on

Formula(s):
\[ m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} \]

Complete an example →

List the procedures & steps:
1. Be sure to have a point and slope before writing Eq. of line.
2. I did not have slope, so use parallel and perpendicular equations, rearrange it and get its slope.
3. Now that I have point a slope, use \( y_1 - y \_1 = m(x - x) \).
4. Sub in point and slope. Note \( y - (-6) = \frac{4}{5}(x - 9) \) was written \( y + 6 = \frac{4}{5}(x - 9) \).
5. Distribute \( \frac{4}{5} \) with \( x - 9 \).
6. Subtract 6 over... rewrite as a fraction with denominator of 5 so its easier to add to \(-\frac{36}{5}\).
7. This form is fine for quizzes or tests. Math XL wants it in General Form.
8. Multiply denominator to clear fraction and rearrange.

Additional Info: \( Ax + By = C \)

WRITE AN EQUATION OF A LINE PARALLEL TO \( 4x - 5y = 3 \) AND THROUGH \( (9, -6) \)

1. \( \text{Point: } (9, -6) \) \( \text{Slope: } m = \frac{4}{5} \)
2. \( 4x - 5y = 3 \)
3. \( y - (-6) = \frac{4}{5}(x - 9) \)
4. \( y + 6 = \frac{4}{5}(x - 9) \)
5. \( y + 6 = \frac{4}{5}x - \frac{36}{5} \)
6. \( y + 6 = \frac{4}{5}x - \frac{36}{5} \)
7. \( y = \frac{4}{5}x - \frac{36}{5} \)
8. \( 5y = 5\left(\frac{4}{5}x - \frac{36}{5}\right) \)
9. \( 5y = 4x - 36 \)
10. \( -4x + 5y = -36 \)

If I was given a question asking for "perpendicular to \( 4x - 5y = 3 \), then if slope = \( \frac{4}{5} \), my perpendicular slope = \( -\frac{5}{4} \).