

Here are some more challenging line problems.

1. Find the equation of the line which goes through $(3, 1)$ and is perpendicular to the line whose equation is $2x + y - 5 = 0$
2. Find the equation of the line with x -intercept 4 and y -intercept -7 .
3. Find the equation of a line that does *not* go through the origin, does go through the point $(3, -5)$ and has its x -intercept equal to 3 times its y -intercept.
4. For what value of k will the line $3kx + 4y - 9 = 0$ be parallel to the line $6x - 3y + 19 = 0$?
5. The equations of two sides of a parallelogram are $3x + 8y + 4 = 0$ and $4x - 5y + 7 = 0$. Find the equations for the other two sides given that the point $(-3, 4)$ is a vertex of the parallelogram.
6. Two opposite vertices of a rectangle are $(6, 2)$ and $(-5, 4)$. Two sides of the rectangle are parallel to the line $8x - 6y + 5 = 0$. Find the equations of the sides.
7. Find the equation of a line that goes through $(2, 1)$ and goes through the intersection of the two lines $3x - 5y - 10 = 0$ and $x + y + 1 = 0$.
8. Find the equation of a line that is parallel to $4x - 3y - 7 = 0$ and goes through the intersection of the two lines $2x + y + 1 = 0$ and $x - 2y + 1 = 0$.
9. The equations $4x + 3y + 11 = 0$, $4x - y - 9 = 0$, and $4x - 3y + 5 = 0$ are the three sides of a triangle. Find the equation of the altitude to the side with equation $4x - 3y + 5 = 0$.