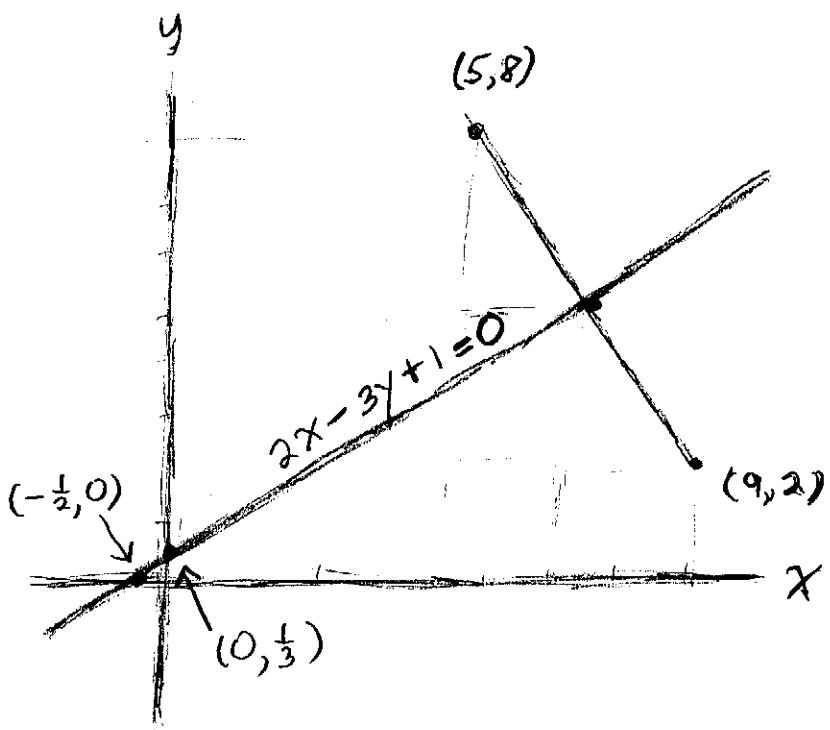
*How to find the equation of the **perpendicular bisector** of a line segment*

1. Find the coordinates of the **midpoint**
2. Find the slope of the **original line**
3. Find the slope of the perpendicular line by taking the **negative reciprocal** of the answer in step 2
4. Find the equation by taking the midpoint (Step 1) and the negative reciprocal slope from step3 and plugging into $y - y_1 = m(x - x_1)$

Example: Find equation of the perpendicular bisector of the line segment joining (5,8) and (9,2)

1. **midpoint** $= \left(\frac{5+9}{2}, \frac{8+2}{2}\right) = (7,5)$
2. **slope** $= m = \frac{2-8}{9-5} = \frac{-6}{4} = \frac{-3}{2}$
3. slope of perpendicular $= \frac{2}{3}$
4. $y - 5 = \frac{2}{3}(x-7)$
   $3y - 15 = 2x - 14$
   $0 = 2x - 3y + 1$



MAT 1275 (Perpendicular bisector)

1. Find the equation of **the perpendicular bisector** of the line segment joining each pair of points below:

   (a) $(-3,5)$ and $(5,-7)$ (b) $\left(-2,\frac{7}{2}\right)$ and $\left(-5,-\frac{5}{2}\right)$ (c) $(-9,9)$ and $(25,-25)$

   (d) $(0.02,-3.5)$ and $(1.06,-11.7)$