Problem # 8
Find the equation of two lines through \( A \), one parallel and the other perpendicular to the line corresponding to the given equation.

a) \( A(4, 1), 2x - 3y + 5 = 0 \)
b) \( A(-1, 1), y = 1 \)

Problem # 9
Find the distance from the line to the point.

a) \( 5x + 12y + 60 = 0; (3, 2) \)
b) \( x + y - 3 = 0; (4, 5) \)

Problem # 10
Find the equation of the bisector of the acute angles formed by the lines \( 3x+4y-12 = 0 \) and \( 12x-5y-20 = 0 \).

Problem # 11
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Problem # 12
Determine permutation matrices \( A \) and \( B \) such that
\[
A \begin{pmatrix} 1 & 2 & 3 \\ 6 & 5 & 4 \\ 7 & 8 & 9 \end{pmatrix} B = \begin{pmatrix} 9 & 8 & 7 \\ 4 & 5 & 6 \\ 3 & 2 & 1 \end{pmatrix}
\]

Problem # 13
Consider the \( n \times n \) matrix \( J_n = \begin{pmatrix} 1 & \cdots & 1 \\ \vdots & \ddots & \vdots \\ 1 & \cdots & 1 \end{pmatrix} \)

What is \( J_n^2 \)?

Problem # 14
Consider the \( n \times n \) matrix \( S_n = \begin{pmatrix} 0 & \cdots & \cdots & 0 & 1 \\ 1 & \ddots & \ddots & \ddots & \vdots \\ \vdots & \ddots & \ddots & \ddots & \vdots \\ \vdots & \ddots & \ddots & \ddots & \vdots \\ 0 & \cdots & 0 & 1 & 0 \end{pmatrix} \)

a) Write down \( S_4 \)
b) What is \( S_2^4 \)?
c) What is \( S_3^4 \)?
d) What is \( S_4^4 \)?
e) (bonus) What is \( S_n \)?