Consider the figure shown below. Compute the normals at locations $a$ and $b$.

\[
\frac{y-y_1}{y_2-y_1} = \frac{x-x_1}{x_2-x_1},
\]

\[
\Rightarrow y = \frac{(x-x_1)}{(x_2-x_1)} (y_2-y_1) + y_1
\]

\[
\Rightarrow (x_2-x_1)y = x_1(y_2-y_1)
\]

\[
\Rightarrow (x_2-x_1)y + x_1(y_2-y_1)+ y_1(y_2-y_1) = 0
\]

\[
\Rightarrow ax + by + c = 0 \quad \text{Eq. 1}
\]

Plane: $[ax + by + cz + d = 0]$

**Submission**

Nothing to submit. Show your work to the instructor.
Given \( ax + by + c = 0 \)

\((a, b) \perp \text{to line} \)

\((x_1, y_1) = (2, -2)\)
\((x_2, y_2) = (8, 8)\)

\[ a = -(8 - 2) = -6 \]
\[ b = (8 - 2) = 6 \]
\[ c = x^2 (8 - 2) - 2(8 - 2) = 0 \]

\[ by = -ax - c \]

3) \[ y = \frac{a}{b} x - \frac{c}{b} \]
\[ = \left(\frac{-6}{6}\right) x = \frac{0}{6} \]
\[ y = x \]

This is \( y = mx + c \)