1998-99 Event 2D
The first question is intended to be a quickie and is worth 1 point. Each of the next
three questions is worth 2 points. Place your answer to each question on the line
provided. You have 12 minutes for this event.

1. The Yangtze River in China falls 17,000 feet in its first 1973 miles. On average, how
   many inches, to the nearest hundredth, does it fall per foot in this stretch of the river?
   (1 mile = 5280 feet) \[
   \frac{17000 \text{ ft}}{1973 \text{ miles}} = \frac{17000 \cdot 12 \text{ inches}}{1973 \cdot 5280 \text{ feet}} \approx 0.02
   \]

2. A line passes through (2, 2) and cuts a triangular area of 9 square units from the first
   quadrant. What are the possible values for the slope of the line?

3. At the lumber yard, 3 clear white pine boards and 2 knotty pine boards sell for $40,
   whereas 2 clear white pine boards and 3 knotty pine boards sell for $35. What is the
   price of a clear pine board?
   \[
   \begin{align*}
   3C + 2K &= 40 \\
   2C + 3K &= 35 \\
   4C + 6K &= 70
   \end{align*}
   \Rightarrow \quad 5C = 50; \quad C = 10.
   \]

4. Let \( O \) denote the origin, and let \( P \) be an arbitrary point in the first quadrant, say it's
   coordinates are \((a, b)\). Where does the perpendicular bisector \( OP \) cut the \( x \)-axis? Give
   the \( x \)-coordinate as a function of \( a \) and \( b \).

\[
\frac{a^2 + b^2}{2a}
\]