From our survey, the heights of your mothers have a mean of 64.2 and a standard deviation of 3.2 inches, and the heights of your fathers have a mean of 70.3 and a standard deviation of 3.3 inches. The correlation between the heights of your mothers and fathers is 0.4.

a) Find the equation of the regression line that predicts father’s heights from mother’s heights.

Slope = \( m = \frac{s_y}{s_x} = \frac{3.3}{3.2} = 0.41 \)

\( Y = mX + [\bar{y} - m\bar{x}] = 0.41X + [70.3 - (0.41)(64.2)] = 0.41X + 43.98 \)
b) Find the prediction of the height of a father who is married to a mother that’s 62 inches tall.

\[
y' = (\text{slope})(x') + \text{intercept} = (0.41)(62) + 43.98 = 70
\]
c) For mothers that are 62 inches tall, what proportion of fathers are taller than 72 inches?

regression line: $y' = (slope)(x') + intercept = (0.41)(62) + 43.98 = 70$

$s_{yx} = (3.3)\sqrt{1 - (0.4)^2} = 3.02$

$z = \frac{72 - 70}{3.02} = 0.66$

$Pr(y > 72) = Pr(z > 0.66) = 0.2546$