

108. We assume scales X and Y are linearly related in the sense that reading x is related to reading y by a linear relationship $y = mx + b$. We determine the constants m and b by solving the simultaneous equations:

$$\begin{aligned}-70.00 &= m(-125.0) + b \\ -30.00 &= m(375.0) + b\end{aligned}$$

which yield the solutions $m = 40.00/500.0 = 8.000 \times 10^{-2}$ and $b = -60.00$. With these values, we find x for $y = 50.00$:

$$x = \frac{y - b}{m} = \frac{50.00 + 60.00}{0.08000} = 1375^\circ X .$$