

51 When $x = 60$ the equation becomes $\ln(1 - P) = -0.0034 - 0.0053(60) \Rightarrow \ln(1 - P) = -0.3214$. To solve for P , we must make use of the inverse property: $e^{\ln k} = k$ with $k = 1 - P$.

$$\begin{aligned}\ln(1 - P) &= -0.3214 \\ \Rightarrow e^{\ln(1 - P)} &= e^{-0.3214} && \{\text{Exponentiate both sides using base } e.\} \\ \Rightarrow 1 - P &= e^{-0.3214} && \{\text{Inverse property: } e^{\ln k} = k\} \\ \Rightarrow 1 - e^{-0.3214} &= P && \{\text{Subtract } e^{-0.3214} \text{ and add } P.\} \\ \Rightarrow P &\approx 0.275 && \{\text{Approximate.}\}\end{aligned}$$

According to this model, if a \$60 tax was placed on each ton of carbon that was burned into the atmosphere, then carbon dioxide emissions would be reduced by 27.5%.