The graph of $y = 5\sqrt{2}\sin\left(\frac{1}{8}x\right)$ does pass through the point $(2\pi, 5)$. However, its amplitude is $5\sqrt{2}$, while the function that was graphed has an amplitude of 5. Also, the period of this function is $\frac{2\pi}{\frac{1}{8}} = 16\pi$, while the function that was graphed has a period of 8π. The correct answer is $y = 5\sin\left(\frac{1}{4}x\right)$.