1. We set the two functions equal to determine the intersection points.

\[ x^4 - 7x^2 + 5 = 86 - 7x^2 \]
\[ x^4 - 81 = 0 \]
\[ (x^2 + 9)(x^2 - 9) = 0 \]
\[ (x^2 + 9)(x + 3)(x - 3) = 0 \]

The graphs intersect when \( x = -3 \) and \( x = 3 \). Thus we have that

\[
\text{area} = \int_{-3}^{3} \left( (86 - 7x^2) - (x^4 - 7x^2 + 5) \right) \, dx = 388.8
\]

2. From \( x = -4 \) to \( x = 6 \), shade in the area between the \( x \)-axis and the graph of \( f(x) \). The area from \( x = -4 \) to \( x = 3 \) should be above the \( x \)-axis and approximately equal to 27. The area from \( x = 3 \) to \( x = 6 \) should be below the \( x \)-axis and approximately equal to 7.5.

\[
\int_{-4}^{6} f(x) \, dx \approx 27 - 7.5 = 19.5
\]

3. Solving \( 0 = 30 - e^x \) for \( x \) gives \( x = \ln 30 \) as the \( x \)-intercept.

\[
\text{area} = \int_{0}^{\ln 30} (30 - e^x) \, dx
\]