Author 1 _____ ☐

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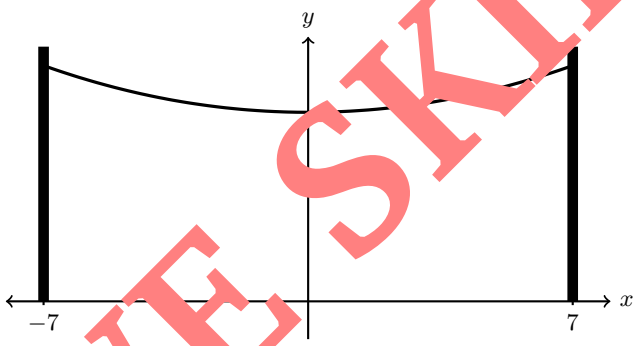
Worksheet 14

1. Use the definitions of $\sinh x$ and $\cosh x$ to show that $\cosh^2 x - \sinh^2 x = 1$.

2. Find the derivative of $f(x) = \sinh(x^2)(7x - \ln(x))$.

3. A telephone line hangs between two poles $14m$ apart in the shape of a catenary $y = 20\cosh\left(\frac{x}{20}\right) - 15$, where x and y are measured in meters. Find the slope of the curve where it meets the left pole.



4. Find the linearization of $f(x) = e^x \cos(x)$ at 0.

5. Use a linear approximation to estimate $\sqrt{100.5}$.