1. Let $f(x) = e^{e^x}$. Compute the value of $f'(0)$.

   Xingjian's Solution:

   By using chain rule here. Let $u(x) = e^x$
$$f'(x) = \left(e^{u(x)}\right)' u'(x)$$
   Here $u'(x) = e^x$, thus
$$f'(x) = \left(e^{e^x}\right)e^x.$$
   Then we can directly plug in $x = 0$.
$$f'(0) = e^{e^0}e^0 = e^1 \times 1 = e.$$
   Thus,
$$\boxed{f'(0) = e.}$$

2. Use implicit differentiation to find $\frac{d}{dx}$ of the equation:
$$2025^{\sqrt{x}\cdot\sqrt{y}} = 2025$$

   Xingjian's Solution: Follow the instruction you learned in lecture 16:

   Differentiate both sides with respect to x:
$$\frac{d}{dx}(2025^{\sqrt{x}\sqrt{y}}) = 2025^{x^{\frac{1}{2}}y^{\frac{1}{2}}}\ln(2025)((xy)^{\frac{1}{2}})' = 2025^{x^{\frac{1}{2}}y^{\frac{1}{2}}}\ln(2025)(\frac{1}{2}x^{-\frac{1}{2}}y^{\frac{1}{2}}+\frac{1}{2}x^{\frac{1}{2}}y^{-\frac{1}{2}}\frac{dy}{dx}).$$
   And $\frac{d}{dx}(2025) = 0$.

   Thus,
$$2025^{x^{\frac{1}{2}}y^{\frac{1}{2}}}\ln(2025)(\frac{1}{2}x^{-\frac{1}{2}}y^{\frac{1}{2}} + \frac{1}{2}x^{\frac{1}{2}}y^{-\frac{1}{2}}\frac{dy}{dx}) = 0.$$
   Then look at here. $2025^{x^{\frac{1}{2}}y^{\frac{1}{2}}}$ and $\ln(2025)$ can be cancelled. (Since when you move these two factor to right hand, you will still get 0.) Thus, it becomes
$$(\frac{1}{2}x^{-\frac{1}{2}}y^{\frac{1}{2}} + \frac{1}{2}x^{\frac{1}{2}}y^{-\frac{1}{2}}\frac{dy}{dx}) = 0.$$
   Now it is going back to HW1 time, we can factor out $x^{\frac{1}{2}}y^{\frac{1}{2}}$, then you will
$$\frac{1}{2}x^{1/2}y^{1/2}(x + y\frac{dy}{dx}) = 0.$$
   Then $(x + y\frac{dy}{dx} = 0)$. Thus,
$$\boxed{\frac{dy}{dx} = -\frac{x}{y}}.$$

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