Class prep quiz on section 3.5, Stewart's Calculus (8th ed.)

1. Suppose $ye^{xy} = 7$. What is $\dfrac{dy}{dx}$?

   (a) $\dfrac{-y^2e^{xy}}{e^{xy} + xye^{xy}}$ (b) y^2e^{xy}

   (c) $\dfrac{dy}{dx}e^{xy} + ye^{xy}\left(x\dfrac{dy}{dx} + y\right)$ (d) $e^{xy} + ye^{xy}(y + x)$

2. What is the equation of the tangent line to $x^3y - 2y^2x = -12$ at $(2, -1)$?

   (a) $\dfrac{7}{8}$ (b) $(y + 1) = \dfrac{2y^2 - 3x^2y}{x^3 - 4yx}(x - 2)$

   (c) $(y + 1) = \dfrac{7}{8}(x - 2)$ (d) $\dfrac{2y^2 - 3x^2y}{x^3 - 4yx}$

3. Which of the following statements is true?

   (a) By differentiating both sides of $\sin y = 1$, we can find $\dfrac{d}{dx}(\sin x)$.

   (b) By differentiating both sides of $\sin y = x$, we can find $\dfrac{d}{dx}(\sin x)$.

   (c) By differentiating both sides of $\sin y = 1$, we can find $\dfrac{d}{dx}(\sin^{-1} x)$.

   (d) By differentiating both sides of $\sin y = x$, we can find $\dfrac{d}{dx}(\sin^{-1} x)$.

4. What formula can we obtain by applying implicit differentiation to the equation $e^y = x$?

   (a) $\dfrac{d}{dx}(\ln x) = \dfrac{1}{x}$ (b) $\dfrac{d}{dx}(e^y) = \dfrac{1}{e^y}$

   (c) $\dfrac{d}{dx}(\ln x) = \dfrac{1}{e^x}$ (d) $\dfrac{d}{dx}\left(\dfrac{1}{e^x}\right) = \dfrac{1}{e^x}$