You may use your notes on this exit ticket. **Be sure to show work and/or explain your reasoning.**

1. A car rental company charges a one-time application fee of 30 dollars, 50 dollars per day, and 0.11 dollars per mile for its cars.

   (a) Write a formula for the cost, C, of renting a car as a function $C = f(d, m)$ of the number of days d and the number of miles driven m.

   (b) Interpret the statement $f(4, 870) = \$365.70$ in the context of this problem, using at least one complete sentence.

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1. Let $\vec{u} = 2\hat{i} + 3\hat{j} + 4\hat{k}$ and $\vec{v} = 3\hat{i} + 2\hat{j} + 1\hat{k}$. Find the following:

   (a) $\|\vec{u}\|$

   (b) $\vec{u} \cdot \vec{v}$

   (c) $\vec{u} \times \vec{v}$

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1. Let $f(x, y) = 3x^2 y - 2y^3 x$.

   (a) Use the limit defintion of the partial derivative to compute $\frac{\partial f}{\partial x}(1, 2)$.

   (b) Compute $\frac{\partial f}{\partial y}$ algebraically (i.e. without using the limit defintion).

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1. Let $f(x, y) = 3x^2 y - 2y^3 x$.

   (a) Compute the gradient $\vec{\nabla} f(x, y)$.

   (b) Compute the directional derivative $D_{\hat{\mathbf{u}}} f(1, 0)$.