Name: _____

You have twenty minutes to complete the following problems. You may use a formula sheet.

1. Calculate the indicated partial derivatives for $f(x, y) \; = \; x^2 y$.

   (a) $f_x(x, y) \; =$

   (b) $f_y(x, y) \; =$

   (c) $f_{xx}(x, y) \; =$

   (d) $f_{xy}(x, y) \; =$

   (e) $f_{yy}(x, y) \; =$

2. Calculate the indicated partial derivatives for $B = 5x\, e^{-2t}$.

   (a) $\dfrac{\partial B}{\partial x} \; =$

   (b) $\dfrac{\partial B}{\partial t} \; =$

   (c) $\dfrac{\partial^2 B}{\partial^2 x} \; =$

   (d) $\dfrac{\partial^2 B}{\partial x \partial t} \; =$

   (e) $\dfrac{\partial B}{\partial^2 t} \; =$

3. Evaluate the integrals:

(a) $\displaystyle\int \left(x^3 + 3x + 11 \right) \, dx$

(b) $\displaystyle\int \left(3 \sin x + 4 \cos x \right) \, dx$

(c) $\displaystyle\int \left(6x^2 + 3e^{2x} \right) \, dx$

(d) $\displaystyle\int \sqrt{5x + 1} \, dx$

(e) $\displaystyle\int \sin^6(3x) \, \cos(3x) \, dx$