

		Name:
8	<p>The temperature in some region is given by $T(x, y, z) = x^4y^3z$. Find:</p> <p>a) The gradient of the temperature at $(1, 1, 2)$</p>	<p>b) The maximum rate of change of the temperature at $(1, 1, 2)$.</p>
	Ans:_____.	Ans:_____.
9	<p>Let $f(x, y) = x^4 + y^4 - 4xy$.</p> <p>a) Find the critical points.</p>	<p>b) Classify the critical points.</p>
	Ans:_____.	Ans:_____.
10	<p>Let $x^2z + yz^3 = 2$. Use implicit differentiation to find:</p> <p>a) z_x.</p>	<p>b) z_y.</p>
	Ans:_____.	Ans:_____.
11	<p>Let $I = \int_0^1 \int_{\sqrt{y}}^1 \sqrt{1+x^3} dx dy$.</p> <p>a) Reverse the order of integration.</p>	<p>b) Evaluate the integral in part (a).</p>
	Ans:_____.	Ans:_____.
12	<p>A solid in the first octant is bounded by $x^2 + z^2 = 9$ and $y = 3x$.</p> <p>a) Set up the volume integral.</p>	<p>b) Compute the volume.</p>
	Ans:_____.	Ans:_____.

Name: _____

18 Evaluate $\oint_C \mathbf{F} \cdot d\mathbf{r}$, where $\mathbf{F} = xy^2 \mathbf{i} - x^2y \mathbf{j}$ and C is the boundary of the region between the circles $x^2 + y^2 = 1$ and $x^2 + y^2 = 9$

Ans: _____.

19 Find the flux of the vector field $\mathbf{F} = x^3 \mathbf{i} + 3yz^2 \mathbf{j} + 3y^2z \mathbf{k}$, over the sphere $x^2 + y^2 + z^2 = 16$

Ans: _____.

20 Find $\int \int_S (\nabla \times \mathbf{F}) \cdot d\mathbf{S}$, where $\mathbf{F} = \langle x^3 - z^3, -y^2z, yz^2 \rangle$ and $S : x = \sqrt{25 - y^2 - z^2}$ oriented positively.

Ans: _____.

Extra Space