PRACTICE QUESTIONS 3
Sections 28.8-28.10 & 29.1-29.4

1. Evaluate $\int \frac{3}{x^2-25}\ dx$

2. Evaluate $\int \frac{\sqrt{x^2-25}}{x}\ dx$

3. Evaluate $\int \frac{\sqrt{36+x^2}}{x}\ dx$

4. Evaluate $\int \frac{y^3+1}{y^3+5y^2+4y}\ dy$

5. Evaluate $\int \frac{1-4x^2}{x^2(x+4)}\ dx$

6. Evaluate $\int \frac{2x^2+3}{(x-1)(x^2+4)}\ dx$

7. Let $f(x,y) = e^x \cos y + e^{-2x} \tan y$. Find $\frac{\partial f}{\partial x}$, $\frac{\partial f}{\partial y}$ and $\frac{\partial^2 f}{\partial x \partial y}$.

8. a) Convert the following cylindrical coordinates to rectangular coordinates: $(r, \theta, z) = (9, \frac{\pi}{3}, 5)$.
b) Convert the following rectangular coordinates to cylindrical coordinates: $(x, y, z) = (-4, 4\sqrt{3}, 1)$.

9. Convert the following equation to cylindrical coordinates and sketch the resulting graph: $3x^2 + 3y^2 = 27$.

10. Evaluate $\int_1^2 \int_x^{x^2} x^2 y\ dy\ dx$

11. Find the first-octant volume below the surface $z = xy$ and bounded by $y = x^2$ and $y = x$.