172 Exam 1 Name: _____

State, as precisely as you can, the Fundamental Theorem of Calculus

Find the following anti derivatives. Please show work, be careful with the coefficients, and label the answer.

1. $\int \sin(2\pi x)dx$

2. $\int \cos^3(x)\sin(x)dx$

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

4. $\int \log(x^4)dx$

1. $\int xe^x dx$

2. $\int x^2 \ln(x) dx$

3. $\int x^3 \sin(x) dx$ (the snap way)

4. $\int \frac{x^3}{x-1} dx$

5. $\int \frac{x}{x-2} dx$

6. $\int \frac{xdx}{(x-1)(x-2)}$

7. $\int \frac{dx}{\sqrt{1-9x^2}}$

8. $\int \frac{dx}{x\sqrt{x^2+4}}$

9. $\int_{\frac{1}{2}}^{1} \frac{dx}{\sqrt{2x-x^2}}$

10. $\int \frac{dx}{1+e^x}$

11. $\int \frac{dx}{1+\sqrt{e^x}}$

12. $\int_1^\infty \frac{\ln(x)}{x} dx$

13. $\displaystyle\int_1^\infty \frac{dx}{x^2+x}$

14. Find the volume of the solid obtained by rotating the region bounded by

$$y = x^3, y = x, x \geq 0$$

about the x axis.

15. Find the volume of the solid obtained by rotating the region bounded by

$$y = x^3, y = x, x \geq 0$$

about the y axis.