

Name: _____

Clear your desk of everything excepts pens, pencils and erasers. If you have a question raise your hand and I will come to you.

1. (2 points) **Fill-in-the-Blank. No work needed. No partial credit available.** The indefinite integral

$$\int y^2 \sqrt{1+y^3} dy$$

is _____.

2. (1 point) **Fill-in-the-Blank. No work needed. No partial credit available.** The definite integral

$$\int_{-1}^1 \left(\frac{\sin x}{x^2} + x^2 \right) dx$$

is _____.

Extra Work Space.

$$\textcircled{1} \int y^2 \sqrt{1+y^3} dy = \int \frac{1}{3} \sqrt{u} du$$

$$u = 1+y^3 \quad = \frac{2}{9} u^{3/2} + c$$

$$du = 3y^2 dy$$

$$= \frac{2}{9} (1+y^3)^{3/2} + c$$

$$\frac{1}{3} du = y^2 dy$$

$$\textcircled{2} \int_{-1}^1 \left(\frac{\sin x}{x^2} + x^2 \right) dx = \int_{-1}^1 \frac{\sin x}{x^2} dx + \int_{-1}^1 x^2 dx$$

$$\frac{\sin(-x)}{(-x)^2} = \frac{-\sin x}{x^2} \text{ odd}$$

$$(-x)^2 = x^2 \text{ even}$$

$$= 0 + 2 \int_0^1 x^2 dx$$

$$= 0 + 2 \left(\frac{1}{3} \right)$$

$$= \frac{2}{3}$$

Continue on to back side