Instructions: Work the problems below as directed. Show all work. Clearly mark your final answers. Use exact values unless the problem specifically directs you to round. Simplify as much as possible. Partial credit is possible, but solutions without work will not receive full credit.

1. Find the area bounded by the graphs $f(x) = \sqrt[3]{x-1}$ and $g(x) = x-1$. Sketch the graph of the area. Clearly label all intersection points on the graph or in your calculations. Set up the appropriate interval and clearly label the result.

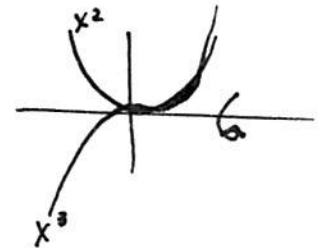$$\int_0^1 (x-1) - \sqrt[3]{x-1}\, dx + \int_1^2 \sqrt[3]{x-1} - (x-1)\, dx$$
$$(x-1)^{1/3}$$
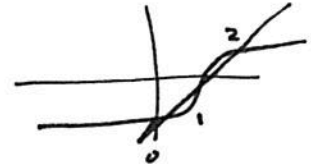
$$\frac{1}{2}x^2 - x - \frac{3}{4}(x-1)^{4/3}\Big|_0^1 + \frac{3}{4}(x-1)^{4/3} - \frac{1}{2}x^2 + x\Big|_1^2 =$$

$$\frac{1}{4} + \frac{1}{4} = \frac{1}{2}$$

2. Find the volume of the solid generated by revolving the region bounded by the graphs of $f(x) = x^2$ and $g(x) = x^3$ around the x-axis using the disk method or the washer method as appropriate.

$$\pi \int_0^1 (x^2)^2 - (x^3)^2\, dx = \pi \int_0^1 x^4 - x^6\, dx =$$

$$\pi \left[\frac{1}{5}x^5 - \frac{1}{7}x^7 \right]_0^1 = \frac{2\pi}{35}$$

washer method