Review Chapter 6 and 7 Test

1) Find the volume of the region that is enclosed by curves $y = x \; and \; y = x^2$ when it is rotated around the x-axis.

2) Find the volume of the solid obtained by rotating about the y-axis the region bounded by $y = 2x^2 - x^3$ and y = 0.

3) Find the volume of the solid obtained by rotating about the x=3 axis the region bounded by $x = y^2$ and $x = 1 - y^2$.

Complete the integration of each of the following problems

4) $\int (3x + 1)^{\sqrt{2}} \, dx$

5) $\int x \sin x \cos x \, dx$

6) $\int \sin^5 x \cos^4 x \, dx$

7) $\int \frac{1}{x^2\sqrt{x^2-1}}\,dx$

8) $\int \frac{2x-3}{x^3+3x} dx$

9) $\int \frac{x+2}{x^2+3x-4} dx$

10) $\int \dfrac{\cos\frac{1}{x}}{x^3}\,dx$