231 Gateway 4 Practice Test - Integrals

No uses of Calculators; No Partial Credit. 30 minutes to finish test. More space will be provided on the actual test.

1. (10 pts) Evaluate: $\int_{-2}^{3} \left(x^2 - 2x + 2 \right) \, dx$.

2. (10 pts) Find $s(t)$: $s''(t) = -1, s'(1) = 3, s(2) = 7$.

3. (10 pts) Evaluate: $\int \left(\frac{4}{5x^2} - 6\sqrt[3]{x} - \frac{1}{3\sqrt{x}} + 2 \right) \, dx$.

4. (10 pts) Evaluate: $\int \frac{2x^3 - 5\sqrt{x^3} + 7\sqrt{x}}{\sqrt[3]{x^2}} \, dx$.

5. (10 pts) Evaluate : $\int 2\sec(3\theta) \tan(3\theta) \, d\theta$.

6. (10 pts) Evaluate : $\int_{1}^{\frac{2}{3}} 7x\sqrt{2 - x^2} \, dx$.

7. (10 pts) Evaluate : $\int_{0}^{\frac{\pi}{6}} 3\cos^7(x) \sin(x) \, dx$.

8. (10 pts) Find $F'(x)$: $F(x) = \int_{\sin x}^{0} \sqrt{t^2 - t + 2} \, dt$.

9. (20 pts) The figure below shows the areas of regions bounded by the graph of f and the x-axis. Evaluate the following integrals using the data from the graph.

i) $\int_{a}^{c} f(x) \, dx$ ii) $\int_{d}^{b} 3f(x) \, dx$ iii) $\int_{a}^{d} 2\,|f(x)|\, dx$ iv) $\int_{b}^{e} -4f(x) \, dx$