**Name:** **Perm number:**

**Test 1**

Time: 75 minutes

1. A particle moves in a straight line and has velocity given by $v(t) = 1.5\sqrt{t}$. Its displacement after the time $t = 4$ seconds is equal to $s(4) = 10$ centimeters. Find its position function $s(t)$.

2. Evaluate the following integrals

- $\int_0^2 1 - 2v + v^2 2dv$

- $\int_7^7 2y^4 - y^2 dy$

- $\int_{\pi/6}^{\pi/4} 2\sec^2 t dt$

3. Find derivatives of the following functions

- $F(x) = \int_1^x \sqrt{1+t^4}dt$

- $y = \int_{2x}^{3x+1} \sin(t^4)dt$

4. Evaluate the following integrals using suitable substitutions

- $\int (2x+1)^2 dx$

- $\int x^2(x^3-8)^{11} dx$

- $\int \sin(x)/\cos^4(x) dx$