Calculus Quiz 3 Date: 2012/12/11 13:30-15:10 100 minutes Total: 100

1. Evaluate the sum (5 points) $\sum_{k=18}^{71} k(k-1)$

2. Find the norm of the partition $P = \{-2, -1.6, -0.5, 0, 0.8, 1\}$. (5 points)

3. Find the average value over the given interval. $f(x) = 3x^2 - 3$ on $[0, 1]$. (5 points)

4. What values of a and b minimi ze the value of $\int_a^b (x^4 - 2x^2)\,dx$. (10 points)

5. Show that the value of $\int_0^1 \sin(x^2)\,dx$ cannot possibly be 2. (5 points)

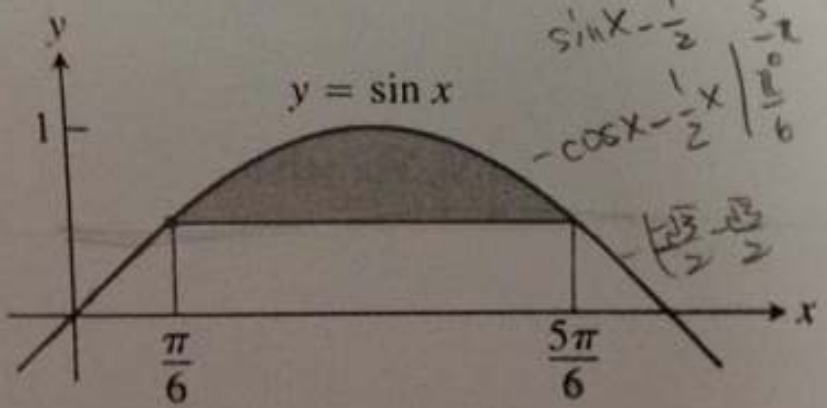
6. Evaluate the integral. (10 points)

$$\int_0^{\pi/6} (\sec x + \tan x)^2\,dx.$$

. Find dy/dx. (10 points)

$$y = \int_0^{\sin x} \frac{dt}{\sqrt{1-t^2}}, \quad |x| < \frac{\pi}{2}.$$

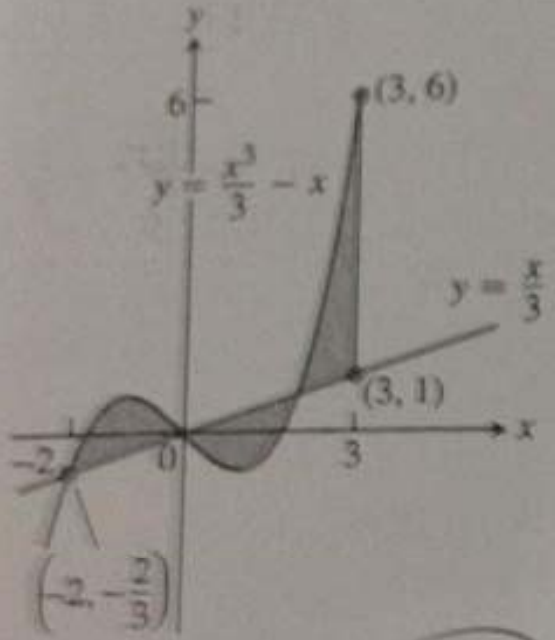
Find the area of the shaded region. (10 points)



9. Evaluate the integral. $\int \frac{1}{x^2}\sqrt{2 - \frac{1}{x}}\,dx$. (10 points)

10. Evaluate the integral. $\int \frac{\sin\sqrt{\theta}}{\sqrt{\theta}\cos^3\sqrt{\theta}}\,d\theta$. (10 points)

11. Find the area of the shaded region. (10 points)



$\frac{1}{3}x^3 - \frac{4}{3}x$

$2\times\left[\frac{1}{12}x^4 - \frac{2}{3}x^2\Big|_0^{-2} + \frac{1}{12}x^4 - \frac{2}{3}x^2\Big|_{-2}^{3}\right]$

$2\times\left|-\frac{16}{12} + \frac{8}{3}\right|$

$\frac{8}{3} + \left|\frac{65}{12} - \frac{10}{3}\right| = \frac{57}{12}$

12. Find the area of the region enclosed by the curves. $x^3 - y = 0$ and $3x^2 - y = 4$. (10 points)

$\frac{32}{12} + \frac{25}{12} =$