Math 1A (7:30am – 8:20am)
Quiz 2 Version A
Fri Apr 15, 2011

NAMES YOU ASKED TO BE CALLED IN CLASS:

_____ & _____

SCORE: ___ / 30 POINTS

NO CALCULATORS ALLOWED

SHOW PROPER ALGEBRAIC WORK (DO NOT USE ANTI-DERIVATIVES)
USE PROPER NOTATION & SIMPLIFY ALL ANSWERS WHERE REASONABLE

State the definition of "definite integral" given in class. SCORE: ___ / 3 POINTS
Use complete sentences and proper algebra & English as shown in class.

SEE 7:30 VERSION D

Evaluate $\int_2^5 (1-2x^2)\,dx$ using the definition of the definite integral and right hand sums. SCORE: ___ / 8 POINTS

$$\lim_{n\to\infty} \sum_{i=1}^{n} \left(1-2\left(2+\frac{3i}{n}\right)^2\right)\frac{3}{n} \quad ,2$$

$$= \lim_{n\to\infty} \frac{3}{n} \sum_{i=1}^{n} \left(1-2\left(4+\frac{12i}{n}+\frac{9i^2}{n^2}\right)\right)$$

$$= \lim_{n\to\infty} \frac{3}{n} \sum_{i=1}^{n} \left(-7-\frac{24i}{n}-\frac{18i^2}{n^2}\right) \quad ,1$$

$$= \lim_{n\to\infty} \frac{3}{n} \left[\sum_{i=1}^{n} -7 - \frac{24}{n}\sum_{i=1}^{n} i - \frac{18}{n^2}\sum_{i=1}^{n} i^2\right] \quad ,1$$

$$= \lim_{n\to\infty} \frac{3}{n} \left[-7n - \frac{24}{n}\cdot\frac{n(n+1)}{2} - \frac{18}{n^2}\cdot\frac{n(n+1)(2n+1)}{6}\right] \quad ,1$$

$$= \lim_{n\to\infty} 3\left[-7-\frac{12(n+1)}{n}-\frac{3(n+1)(2n+1)}{n^2}\right]$$

$$= 3[-7-12-6] \quad ,1$$

$$= -75 \quad ,1$$

MULTIPLE CHOICE: CIRCLE THE CORRECT ANSWER SCORE: ___ / 3 POINTS

$\int_{-8}^{3} f(x)\,dx =$

[a] -17

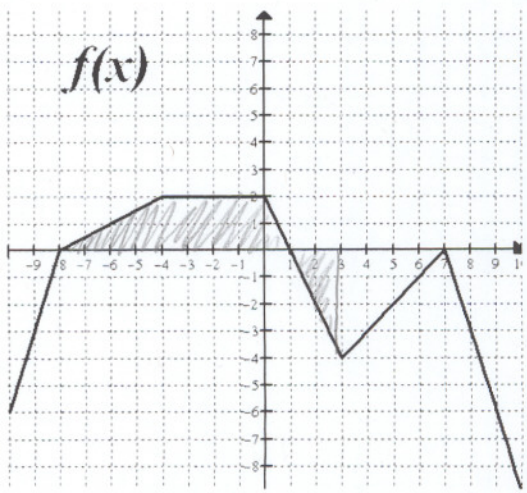
[b] -5

[c] 2

[d] 5

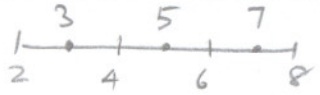
[e] 9

[f] none of the above



$\frac{1}{2}(4+9)2$
$-\frac{1}{2}(2)(4)$
$= 9$

If the velocity of a particle at time t is given by $v(t) = t^2 - 4$, estimate the distance travelled by the object from $t = 2$ to $t = 8$ using 3 equal subintervals and the midpoint rule. **SCORE: ___ / 3 POINTS**

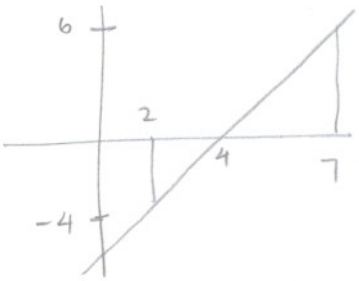


$\Delta x = \frac{8-2}{3} = 2$

$(3^2-4)2 + (5^2-4)2 + (7^2-4)2 = 5\cdot 2 + 21\cdot 2 + 45\cdot 2 = 142$ (1, 2, 1)

OR

Evaluate $\int_2^7 (2x-8)\,dx$ using geometry. **Sketch a diagram and show the calculations used.** **SCORE: ___ / 3 POINTS**



$-\frac{1}{2}(4)(4-2) + \frac{1}{2}(6)(7-4) = -\frac{1}{2}(4)(2) + \frac{1}{2}(6)(3)$

OR

$= -4 + 9$

$= 5$ (1)

Write $\lim_{n\to\infty} \sum_{k=1}^{n} \frac{5}{n}\left(2 + \frac{5k}{n}\right)^2$ as a definite integral. **Do NOT evaluate the limit/definite integral.** **SCORE: ___ / 3 POINTS**

$\frac{1}{4}\int_{2}^{7} x^2\,dx$ (1, $\frac{1}{2}$, 1, $\frac{1}{4}$)

Write $\int_{-2}^{-4} g(x)\,dx - \int_{4}^{2} g(x)\,dx + \int_{-4}^{2} g(x)\,dx$ as a single integral in the form $\int_a^b g(x)\,dx$. **SCORE: ___ / 3 POINTS**

Show each step CLEARLY.

SEE 7:30 VERSION D

If $\int_1^7 g(x)\,dx = -4$, find $\int_7^1 (2 + g(x))\,dx$. **Show each step CLEARLY.** **SCORE: ___ / 4 POINTS**

$= -\int_1^7 (2+g(x))\,dx$ (1)

$= -\left[\int_1^7 2\,dx + \int_1^7 g(x)\,dx\right]$ (1)

$= -\left[2(7-1) + (-4)\right]$ (1)

$= -[12-4] = -8$ (1)

OR

OR

$= \int_7^1 2\,dx + \int_7^1 g(x)\,dx$ (1, 1)

$= 2(1-7) - \int_1^7 g(x)\,dx$ (1, 1)

$= -12 - (-4)$ (1)

$= -8$ (1)