Math 1B (7:30am – 8:20am)
Quiz 2
Fri Oct 2, 2009

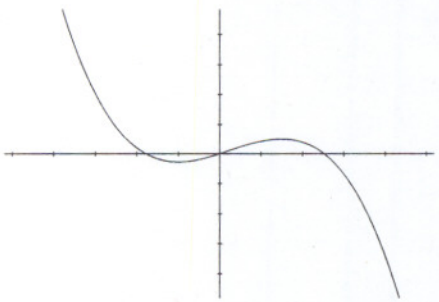
SCORE: ___ / 16 POINTS + ___ / 4 POINTS

What month is your birthday ? ___ ___
What are the first 2 digits of your address ? ___ ___
What are the last 2 digits of your zip code ? ___ ___
What are the last 2 digits of your social security number ? ___ ___
[IF YOU DO NOT HAVE A SOCIAL SECURITY NUMBER, USE YOUR STUDENT ID NUMBER]

To receive full credit, it should be clear how you arrived at all numerical answers

The average value of the function in the graph on $[-1, 1]$ is 1. Its average value on $[1, 4]$ is -19. **SCORE: ___ / 4 POINTS**

Find its average value on $[-1, 4]$.



$\frac{1}{1-(-1)}\int_{-1}^{1} f(x)\,dx = 1$ $\quad \frac{1}{4-1}\int_{1}^{4} f(x)\,dx = -19$

$\frac{1}{2}\int_{-1}^{1} f(x)\,dx = 1$ $\quad \frac{1}{3}\int_{1}^{4} f(x)\,dx = -19$

$\int_{-1}^{1} f(x)\,dx = 2$ 1 $\quad \int_{1}^{4} f(x)\,dx = -57$ 1

$\frac{1}{4-(-1)}\int_{-1}^{4} f(x)\,dx = \frac{1}{5}\left[\int_{-1}^{1} f(x)\,dx + \int_{1}^{4} f(x)\,dx\right]$

$= \frac{1}{5}$ $\frac{1}{2}$ $[2 + -57]$ 1

$= -11$ $\frac{1}{2}$

Write as a single integral. Assume that f is continuous. **SCORE: ___ / 2 POINTS**

[a] $\int_2^9 f(x)\,dx - \int_2^4 f(x)\,dx$

$\int_2^9 f(x)\,dx + \int_4^2 f(x)\,dx$

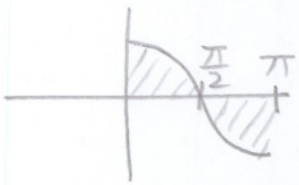
$\int_4^9 f(x)\,dx$ 1

[b] $\int_5^9 f(x)\,dx + \int_3^5 f(x)\,dx$

$\int_3^9 f(x)\,dx$ 1

Write the area between the graph of $y = \cos x$ and the x-axis on $[0, \pi]$ using integral(s). **SCORE: ___ / 2 POINTS**

DO NOT EVALUATE THE INTEGRAL(S).



$\int_0^{\frac{\pi}{2}} \cos x\,dx + \left(-\int_{\frac{\pi}{2}}^{\pi} \cos x\,dx\right)$

$\int_0^{\frac{\pi}{2}} \cos x\,dx - \int_{\frac{\pi}{2}}^{\pi} \cos x\,dx$ 2

OR $\int_0^{\frac{\pi}{2}} \cos x\,dx + \int_{\pi}^{\frac{\pi}{2}} \cos x\,dx$

Consider the function values in the table below. **SCORE: ___ / 4 POINTS**

x	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0
$f(x)$	2.3	2.7	2.9	2.7	2.1	1.7	1.2	1.5	1.6	1.1	0.6

[a] Estimate $\int_{1.0}^{2.4} f(x)\,dx$ using a left endpoint sum. **[NOTE: READ THE QUESTION CAREFULLY.]**

$(2.3+2.7+2.9+2.7+2.1+1.7+1.2) * 0.2$ (1) (1)

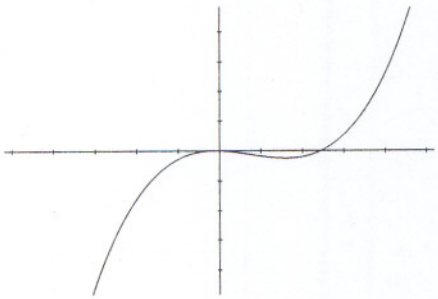
$= 3.12$ (½)

[b] Use your estimate in [a] to approximate the average value of $f(x)$ on $[1.0, 2.4]$.

$\frac{1}{2.4-1.0}\int_{1.0}^{2.4} f(x)\,dx \approx \frac{1}{1.4}(3.12) \approx 2.23$ (1) (½)

The average value of the function in the graph on $[-1, 2]$ is -5. Its average value on $[2, 4]$ is 30. **SCORE: ___ / 4 POINTS**

Find its average value on $[-1, 4]$.



$\frac{1}{2-(-1)}\int_{-1}^{2} f(x)\,dx = -5$ $\quad \frac{1}{4-2}\int_{2}^{4} f(x)\,dx = 30$

$\frac{1}{3}\int_{-1}^{2} f(x)\,dx = -5$ $\quad \frac{1}{2}\int_{2}^{4} f(x)\,dx = 30$

$\int_{-1}^{2} f(x)\,dx = -15$ (1) $\quad \int_{2}^{4} f(x)\,dx = 60$ (1)

$\frac{1}{4-(-1)}\int_{-1}^{4} f(x)\,dx = \frac{1}{5}\left[\int_{-1}^{2} f(x)\,dx + \int_{2}^{4} f(x)\,dx\right]$

$= \frac{1}{5}[-15+60]$ (½) (1)

$= 9$ (½)