Circle your Instructor:
Faudree, Williams, Zirbes

_____ / 25

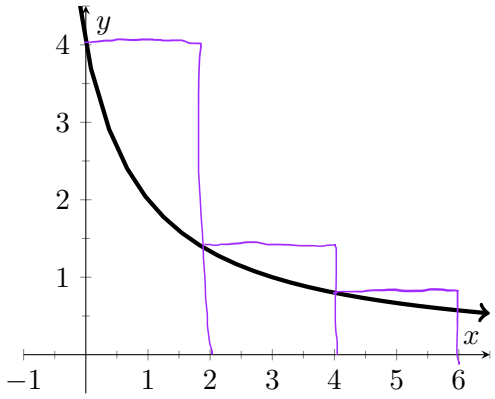
Math 251 Fall 2017 **Quiz #10, November 22nd**

Name: Solution

There are 25 points possible on this quiz. This is a closed book quiz. Calculators and notes are not allowed. **Please show all of your work!** If you have any questions, please raise your hand.

Exercise 1. (9 pts.) Estimate the area under $f(x) = \frac{4}{x+1}$ from $x = 0$ to $x = 6$ using three approximating rectangles and

(a.) left endpoints. Sketch the rectangles on the graph below.

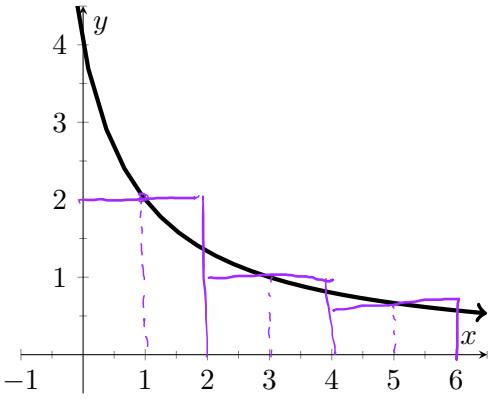


$2\left(4 + 4/3 + 4/5\right)$

$= 2\left(\frac{60 + 20 + 12}{15}\right)$

$= 2\ \frac{92}{15} = \frac{184}{15}$

(b.) midpoints as sample points. Sketch the rectangles on the graph below.



$2\left(\frac{4}{5} + \frac{4}{4} + \frac{4}{6}\right)$

$= 2 + 2\left(\frac{24 + 20}{30}\right) = 2 + \frac{48}{30}$

$= 3 + \frac{18}{30}$

Exercise 2. (3 pts.) The speed of a skier increased steadily during the first three seconds of a race. Her speed at half-second intervals is given in the table. Find a lower estimate for the distance she traveled during the first three seconds. Include units with your answer.

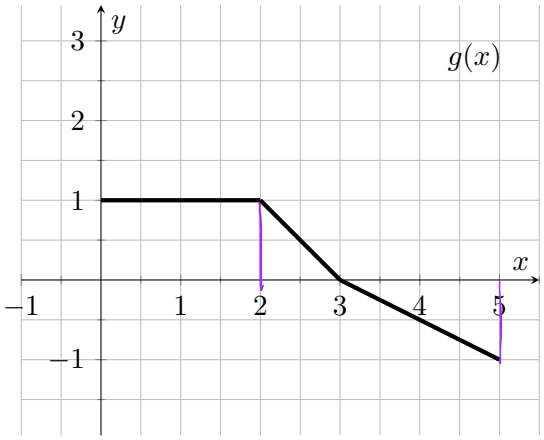
time (in seconds)	0	0.5	1	1.5	2	2.5	3
velocity (in feet/sec)	0	4	10	16	20	22	24

$\frac{1}{2}\left(0 + 4 + 10 + 16 + 20 + 22\right) = \frac{72}{2} = 36$ ft

Circle your Instructor:
Faudree, Williams, Zirbes

_____ / 25

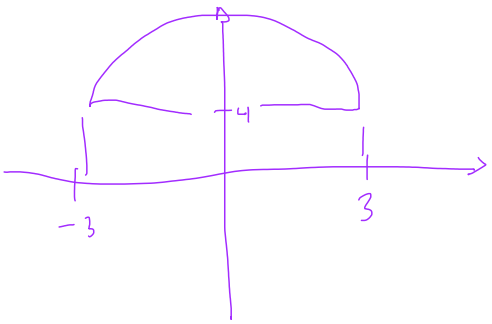
Exercise 3. (4 pts.) Use the graph of $g(x)$ to evaluate the integral $\int_0^5 g(x)\,dx$.



$\int_0^5 g(x)\,dx = 2\cdot 1 + \frac{1}{2}\cdot 1\cdot 1 - \frac{1}{2}\cdot 1\cdot 2$

$= 2 + \frac{1}{2} - 1 = \frac{3}{2}$

Exercise 4. (4 pts.) Evaluate the integral $\int_{-3}^{3} (\sqrt{9-x^2}+4)\,dx$ by interpreting it in terms of areas.



$\frac{1}{2}\pi\cdot 9 + 6\cdot 4 = \frac{9}{2}\pi + 24$

Exercise 5. (5 pts.) Assume that $\int_1^5 f(x)\,dx = 7$. Use this fact and the properties of integrals to evaluate the integrals below.

(a.) $\int_5^1 f(x)\,dx$ $= -7$

(b.) $\int_1^5 (3 - 2\pi f(x))dx$

$= 12 - 14\pi$