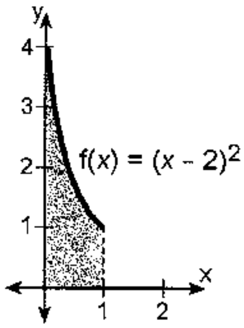
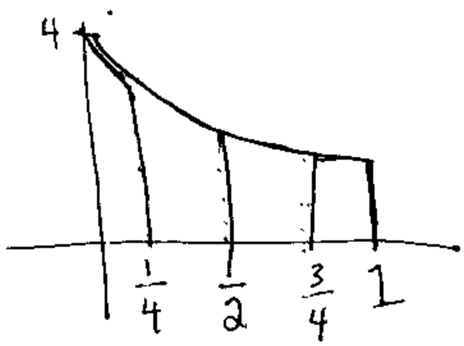
Name: ______________________________

1) Calculate the approximate area of the shaded region in the graph below by employing the trapezoidal rule using divisions at $x = \frac{1}{4}$, $x = \frac{1}{2}$, and $x = \frac{3}{4}$.



1) $\frac{25}{12}$
2) $\frac{75}{24}$
3) $\boxed{\frac{75}{32}}$
4) $\frac{155}{64}$
5) $\frac{145}{64}$



$h = \Delta x = \frac{1}{4}$

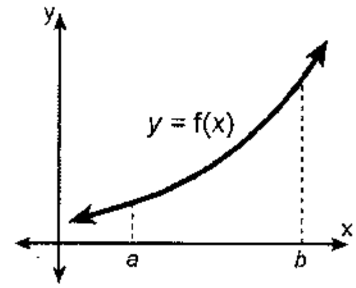
$\text{Area} = \frac{1}{2}\left(f(0) + f\left(\tfrac{1}{4}\right)\right)\frac{1}{4} + \frac{1}{2}\left(f\left(\tfrac{1}{4}\right) + f\left(\tfrac{1}{2}\right)\right)\frac{1}{4} + \frac{1}{2}\left(f\left(\tfrac{1}{2}\right) + f\left(\tfrac{3}{4}\right)\right)\frac{1}{4} + \frac{1}{2}\left(f\left(\tfrac{3}{4}\right) + f(1)\right)\frac{1}{4}$

$= \frac{1}{2}\left(4 + \frac{49}{16}\right)\frac{1}{4} + \frac{1}{2}\left(\frac{49}{16} + \frac{9}{4}\right)\frac{1}{4} + \frac{1}{2}\left(\frac{9}{4} + \frac{25}{16}\right)\frac{1}{4} + \frac{1}{2}\left(\frac{25}{16} + 1\right)\frac{1}{4}$

$= \frac{1}{8}\left(4 + 2\left(\frac{49}{16}\right) + 2\left(\frac{9}{4}\right) + 2\left(\frac{25}{16}\right) + 1\right)$

$= \boxed{75/32}$ or $= \boxed{2.34375}$

2) According to the graph below, which of the following ~~is~~ must be false for function f when the Riemann sums are used to approximate the value of $\int_a^b f(x)\,dx$?

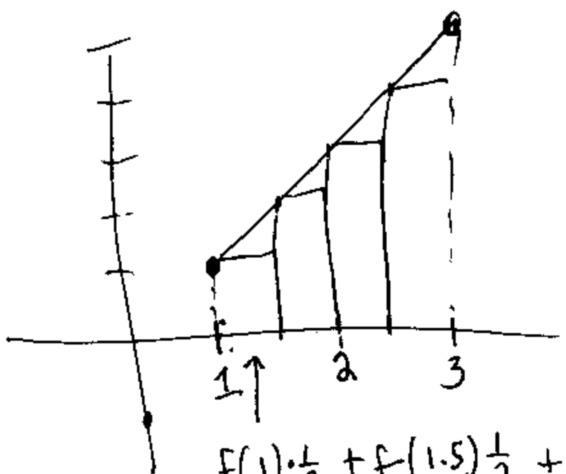


1) trapezoidal sum < right hand sum ✓
2) midpoint sum < trapezoidal sum ✓ ?
3) right hand sum > midpoint sum ✓
4) left hand sum > trapezoidal sum ✗
5) left hand sum < right hand sum ✓

3) Approximate the value of the given definite integral using the indicated method of Riemann Sums for the stated number of uniform subdivisions, n. [*Round to at least 3 decimal places where necessary.*]

$\int_1^3 (2x - 1)\,dx$, left hand rule $n = 4$

\#3



$$f(1)\cdot\tfrac{1}{2} + f(1.5)\tfrac{1}{2} + f(2)\tfrac{1}{2} + f(2.5)\tfrac{1}{2}$$

Area $= 1\cdot\frac{1}{2} + 2\cdot\frac{1}{2} + 3\cdot\frac{1}{2} + 4\cdot\frac{1}{2}$

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

$= \frac{10}{2}$

$= \boxed{5}$

Right = 7 ave = 6 trap = 6

midpt = 6