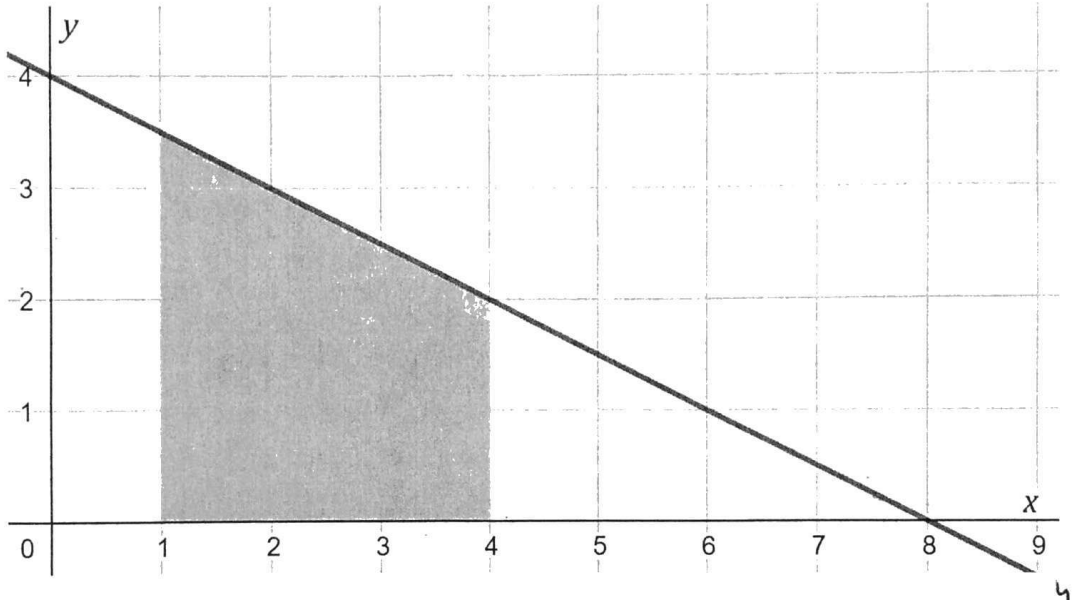
MA 16010 Quiz 11 (Lessons 29, 30)

Write your name, section number (399 for 8:30, 418 for 9:30), and quiz number on the top of your quiz, **front and back.** You may use a one–line calculator.

1. Use the **left and right** Riemann sums with 4 rectangles to estimate the (signed) area under the curve of
$$y = x^2 - 1$$
on the interval $[2, 10]$.

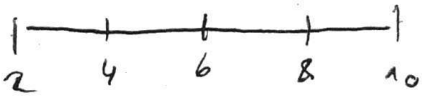
2. Find the definite integral that expresses the area of the region sketched below.



$y = ax + b$

1.

$n = 4 \quad \Delta x = \frac{10-2}{4} = 2$



$x_0 = 2$
$x_1 = 4$
$x_2 = 6$
$x_3 = 8$
$x_4 = 10$

$L_4 = 2\cdot(2^2-1) + 2\cdot(4^2-1) + 2\cdot(6^2-1) + 2\cdot(8^2-1) =$
$= 2\cdot 3 + 2\cdot 15 + 2\cdot 35 + 2\cdot 63 = 232$

$R_4 = 2\cdot(4^2-1) + 2\cdot(6^2-1) + 2\cdot(8^2-1) + 2\cdot(10^2-1) =$
$= 2\cdot 15 + 2\cdot 35 + 2\cdot 63 + 2\cdot 99 = 424$

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2. int. limits: 1, 4

$y = ax + b$, knots: 1) $4 = a\cdot 0 + b \rightarrow b = 4$ 2) $0 = a\cdot 8 + 4$ $\rightarrow y = -\frac{1}{2}x + 4$, and the integral

$8a = -4$
$a = -\frac{1}{2}$

$0 = a\cdot 8 + 4$

is $\int_1^4 \left(-\frac{1}{2}x + 4\right) dx$