5.2 EXERCISES

In the following exercises, express the limits as integrals.

60. $\lim\limits_{n \to \infty} \sum\limits_{i=1}^{n} (x_i^*)\Delta x$ over $[1, 3]$

61. $\lim\limits_{n \to \infty} \sum\limits_{i=1}^{n} \left(5(x_i^*)^2 - 3(x_i^*)^3\right)\Delta x$ over $[0, 2]$

62. $\lim\limits_{n \to \infty} \sum\limits_{i=1}^{n} \sin^2(2\pi x_i^*)\Delta x$ over $[0, 1]$

63. $\lim\limits_{n \to \infty} \sum\limits_{i=1}^{n} \cos^2(2\pi x_i^*)\Delta x$ over $[0, 1]$

In the following exercises, given L_n or R_n as indicated, express their limits as $n \to \infty$ as definite integrals, identifying the correct intervals.

64. $L_n = \frac{1}{n} \sum\limits_{i=1}^{n} \frac{i-1}{n}$

65. $R_n = \frac{1}{n} \sum\limits_{i=1}^{n} \frac{i}{n}$

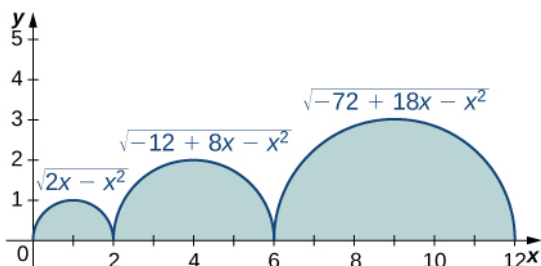66. $L_n = \frac{2}{n} \sum\limits_{i=1}^{n} \left(1 + 2\frac{i-1}{n}\right)$

67. $R_n = \frac{3}{n} \sum\limits_{i=1}^{n} \left(3 + 3\frac{i}{n}\right)$

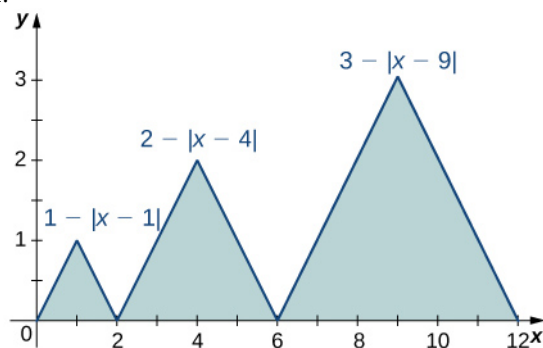68. $L_n = \frac{2\pi}{n} \sum\limits_{i=1}^{n} 2\pi \frac{i-1}{n} \cos\left(2\pi \frac{i-1}{n}\right)$

69. $R_n = \frac{1}{n} \sum\limits_{i=1}^{n} \left(1 + \frac{i}{n}\right)\log\left(\left(1 + \frac{i}{n}\right)^2\right)$

In the following exercises, evaluate the integrals of the functions graphed using the formulas for areas of triangles and circles, and subtracting the areas below the x-axis.
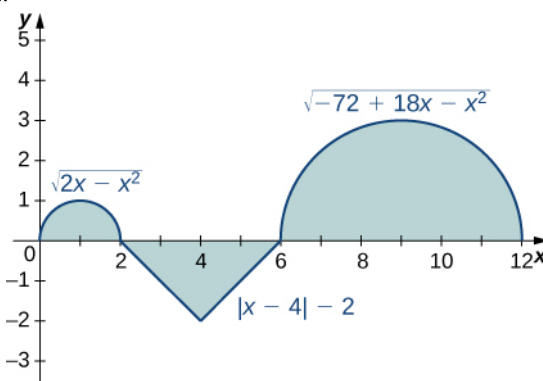
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