Calculus 2 Workbook

Other approximation methods

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OVER AND UNDERESTIMATION

■ 1. Use a Riemann sum to estimate the maximum and minimum area under the curve on $[0,\pi]$. Use rectangular approximation methods with 4 equal subintervals. Round the answer to 2 decimal places.

$$f(x) = 5\sin\frac{x}{2} + 3$$

■ 2. Use a Riemann sum to estimate the maximum and minimum area under the curve on $[0,4]$. Use rectangular approximation methods with 4 equal subintervals.

$$g(x) = \frac{1}{4}(x-4)^2 + 1$$

■ 3. Use a Riemann sum to estimate the maximum and minimum area under the curve on $[0,9]$. Use rectangular approximation methods with 3 equal subintervals. Round the answer to 2 decimal places.

$$h(x) = \frac{1}{2}\sqrt{7x} + 2$$

LIMIT PROCESS TO FIND AREA ON [A,B]

■ 1. Use the limit process to find the area of the region between the graph of $f(x)$ and the x-axis on the interval $[3,7]$.

$$f(x) = x^2 + 2$$

■ 2. Use the limit process to find the area of the region between the graph of $g(x)$ and the x-axis on the interval $[2,6]$.

$$f(x) = x^2 - x + 3$$

■ 3. Use the limit process to find the area of the region between the graph of $h(x)$ and the x-axis on the interval $[2,5]$.

$$h(x) = x^2 - 3x + 7$$

LIMIT PROCESS TO FIND AREA ON [-A,A]

■ 1. Use the limit process to find the area of the region between the graph of $f(x)$ and the x-axis on the interval $[-5,5]$.

$$f(x) = x^2 + 1$$

■ 2. Use the limit process to find the area of the region between the graph of $g(x)$ and the x-axis on the interval $[-3,3]$.

$$g(x) = 3x^2 - 4$$

■ 3. Use the limit process to find the area of the region between the graph of $h(x)$ and the x-axis on the interval $[-1,1]$.

$$h(x) = 4x^2 - x + 1$$

TRAPEZOIDAL RULE

■ 1. Using $n = 6$ and the Trapezoidal rule, approximate the value of the integral. Round the answer to 2 decimal places.

$$\int_{4}^{16} 2\sqrt[3]{x} + 3 \; dx$$

■ 2. Using $n = 6$ and the Trapezoidal rule, approximate the value of the integral.

$$\int_{0}^{6} \frac{1}{4}x^4 - \frac{1}{2}x^3 + 2x^2 - 5x + 8 \; dx$$

■ 3. Using $n = 4$ and the Trapezoidal rule, approximate the value of the integral.

$$\int_{0}^{8} \frac{1}{2}x^2 - 3x + 6 \; dx$$

■ 4. Using $n = 4$ and the Trapezoidal rule, approximate the value of the integral.

$$\int_{0}^{16} \frac{1}{16}x^4 - \frac{1}{2}x^3 - x^2 - x + 1 \; dx$$

SIMPSON'S RULE

■ 1. Use Simpson's Rule with $n = 6$ to approximate the value of the integral. Round the answer to 2 decimal places.

$$\int_2^8 6\sqrt{3x} + 5 \, dx$$

■ 2. Use Simpson's Rule with $n = 8$ to approximate the value of the integral. Round the answer to 2 decimal places.

$$\int_4^{28} 120(0.95)^x \, dx$$

■ 3. Use Simpson's Rule with $n = 4$ to approximate the value of the integral. Round the answer to 2 decimal places.

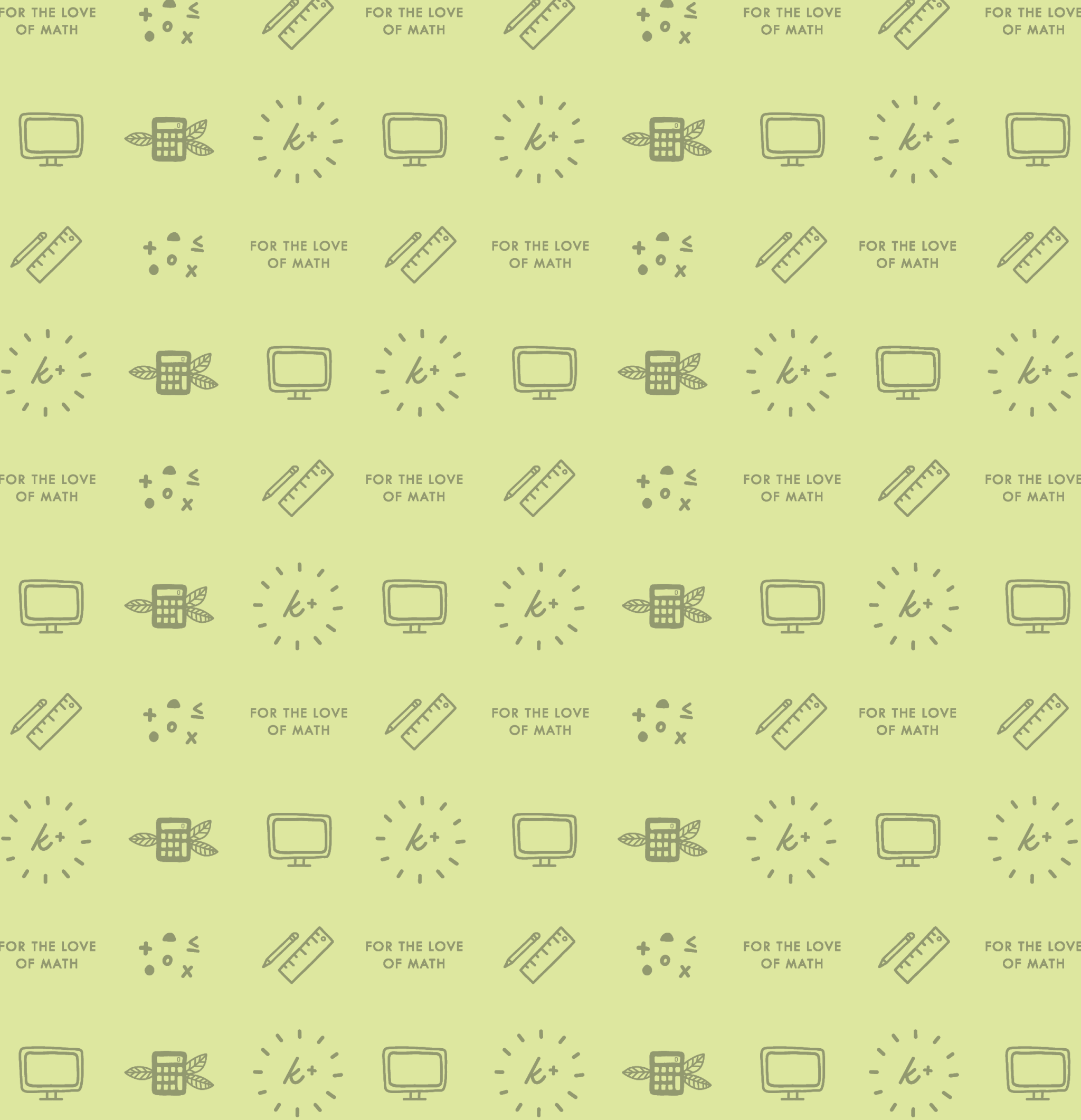
$$\int_5^7 3\ln(x + 5) - 2 \, dx$$

■ 4. Use Simpson's Rule with $n = 4$ to approximate the value of the integral.

$$\int_{-3}^9 x^2 + 3x + 2 \, dx$$

5. Use Simpson's Rule with $n = 6$ to approximate the value of the integral. Round the answer to 2 decimal places.

$$\int_{0.4}^{1.6} \frac{1}{3}x^3 - x^2 + 5x + 4 \; dx$$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