Calculus 2 Workbook

Taylor series

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TAYLOR SERIES

■ 1. Find the third-degree Taylor polynomial and use it to approximate $f(5)$.

$$f(x) = 3\sqrt{x+1}$$

$n = 3$ and $a = 3$

■ 2. Find the third-degree Taylor polynomial and use it to approximate $f(4)$.

$$f(x) = e^{2x} + 9$$

$n = 3$ and $a = 2$

■ 3. Find the fourth-degree Taylor polynomial and use it to approximate $f(\pi/24)$.

$$f(x) = \sin(6x) + 5$$

$n = 4$ and $a = \dfrac{\pi}{12}$

RADIUS AND INTERVAL OF CONVERGENCE OF A TAYLOR SERIES

1. Find the radius of convergence of the Taylor polynomial.

$$P_{(3)}(x) = 1 + 2(x-3) + 4(x-3)^2 + 8(x-3)^3$$

2. Find the radius of convergence of the Taylor polynomial.

$$P_{(3)}(x) = 4 - 4(x-5) + 16(x-5)^2 - 64(x-5)^3$$

3. Find the radius of convergence of the Taylor polynomial.

$$P_{(3)}(x) = \frac{1}{4} - \frac{1}{4}(x-4) + \frac{1}{8}(x-4)^2 - \frac{1}{24}(x-4)^3$$

TAYLOR'S INEQUALITY

1. Find Taylor's inequality for the function.

$$f(x) = 5\cos x$$

2. Find Taylor's inequality for the function.

$$f(x) = 3\sin x$$

3. Find Taylor's inequality for the function.

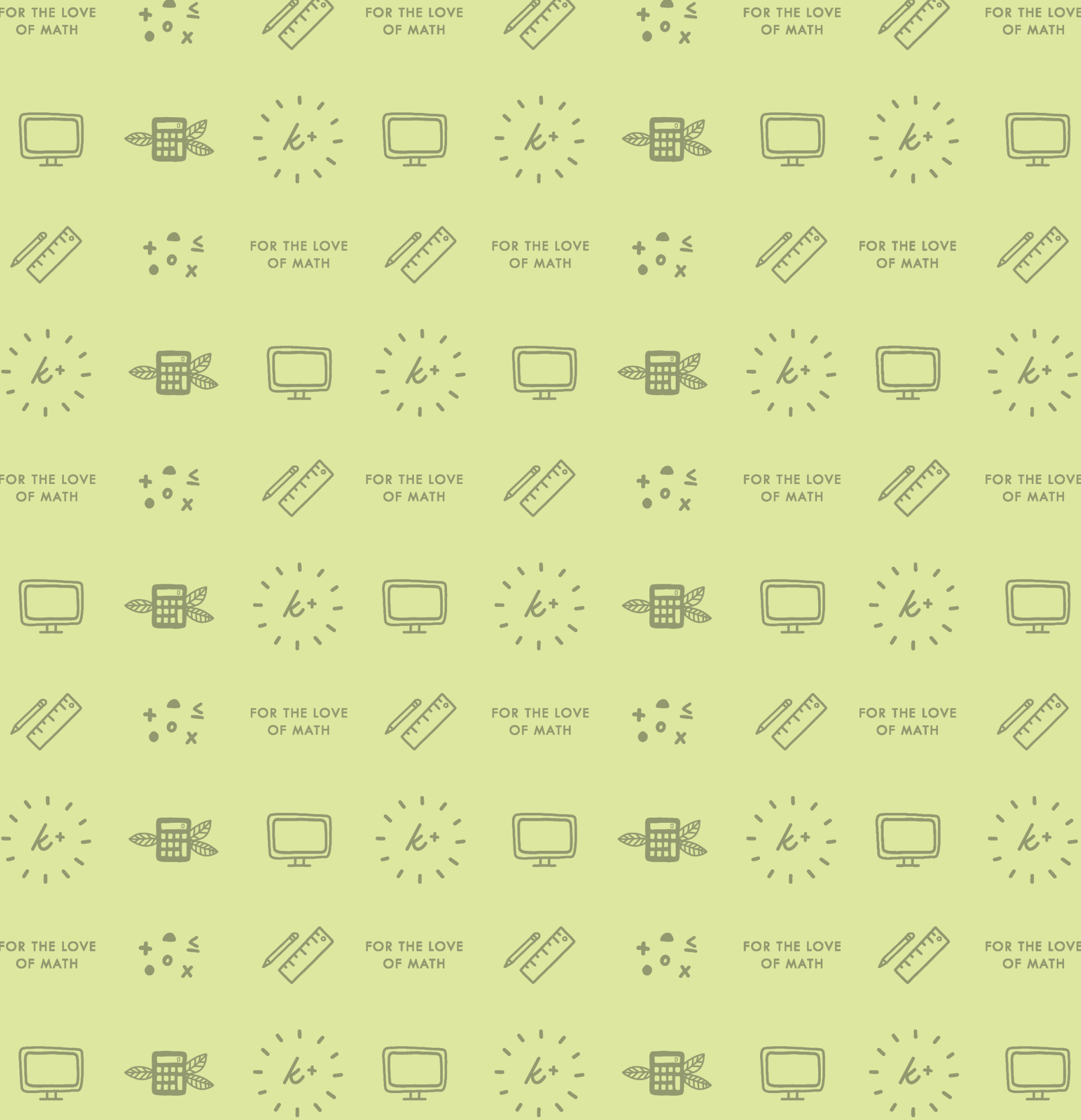
$$f(x) = 7\sin x + 5$$

4. Find Taylor's inequality for the function.

$$f(x) = \pi\cos x$$

5. Find Taylor's inequality for the function.

$$f(x) = e\sin x$$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