Calculus 3 Workbook

Approximating triple integrals

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MIDPOINT RULE FOR TRIPLE INTEGRALS

■ 1. Use the midpoint rule to approximate the value of the triple integral, using boxes with sides $2 \times 2 \times \pi$.

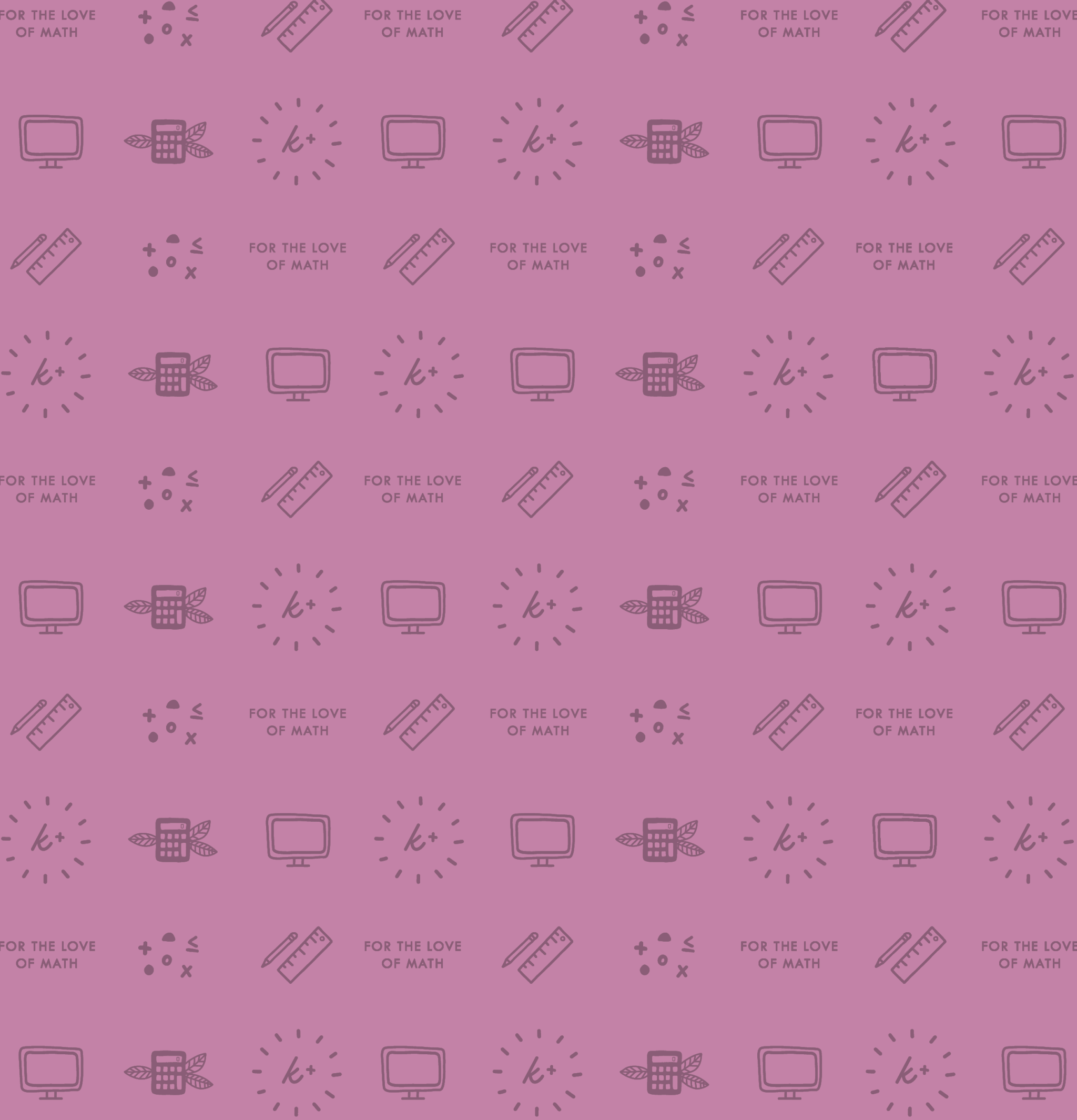
$$\int_{-2}^{2} \int_{0}^{4} \int_{-2\pi}^{2\pi} x^2 y \cos z \; dz \; dy \; dx$$

■ 2. Use the midpoint rule to approximate the value of the triple integral, where D is the cube with opposite corners $(0,1,-1)$ and $(4,5,3)$. Use cubes with side length 2.

$$\iiint_{D} \log_2((x+1)^5 y^2 (z+2)) \; dV$$

■ 3. Use the midpoint rule to approximate the value of the improper triple integral. Use cubes with side length 1.

$$\int_{0}^{1} \int_{0}^{1} \int_{0}^{\infty} \log_4(x) \frac{(y-1)^3}{z^2} \; dz \; dy \; dx$$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