

Assignment 21

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21-2

(a)

$$\begin{aligned}\int_3^7 k \, dx &= 1 \\ kx \Big|_{x=3}^{x=7} &= 1 \\ 7k - 3k &= 1 \\ 4k &= 1 \\ k &= \frac{1}{4}\end{aligned}$$

(b)

$$\begin{aligned}\int_3^7 \frac{x}{4} \, dx &= \frac{x^2}{8} \Big|_{x=3}^{x=7} \\ &= \frac{7^2}{8} - \frac{3^2}{8} \\ &= \frac{49}{8} - \frac{9}{8} \\ &= \frac{40}{8} \\ &= 5\end{aligned}$$

(c)

$$\begin{aligned} \int_3^7 (x-5)^2 k dx &= k \int_3^7 (x-5)^2 dx \\ &= \frac{1}{4} \left(\frac{x^3}{3} - 5x^2 + 25x \right) \Big|_{x=3}^{x=7} \\ &= \left(\frac{1}{4} \left(\frac{7^3}{3} - 5 * 7^2 + 25 * 7 \right) \right) - \left(\frac{1}{4} \left(\frac{3^3}{3} - 5 * 3^2 + 25 * 3 \right) \right) \\ &= \frac{133}{12} - \frac{39}{4} \\ &= 4 \end{aligned}$$