Assignment 21

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21-2

(a)

$$\int_3^7 k \, dx = 1$$
$$kx\big|_{x=3}^{x=7} = 1$$
$$7k - 3k = 1$$
$$4k = 1$$
$$k = \frac{1}{4}$$

(b)

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

(c)

$$\int_3^7 (x-5)^2 k \, dx$$

$$= k \int_3^7 (x-5)^2 \, dx$$

$$= \frac{1}{4}\left(\frac{x^3}{3} - 5x^2 + 25x\right)\Big|_{x=3}^{x=7}$$

$$= \left(\frac{1}{4}\left(\frac{7^3}{3} - 5*7^2 + 25*7\right)\right) - \left(\frac{1}{4}\left(\frac{3^3}{3} - 5*3^2 + 25*3\right)\right)$$

$$= \frac{133}{12} - \frac{39}{4}$$

$$= 4$$