

Exercise 8-32

$$1.0 \text{ kcal} \times \frac{4186 \text{ J}}{\text{kcal}} = 4186 \text{ J}$$

$$\text{Efficiency} = 25\% \therefore \text{useful energy} = 0.25 (4186 \text{ J}) \\ = 1.05 \times 10^3 \text{ J}$$

Let $n = \#$ of pushups.

$$\therefore n m g y = 1.05 \times 10^3 \text{ J}$$

$$n (59 \text{ kg}) (9.80 \text{ m/s}^2) (0.26 \text{ m}) = 1.05 \times 10^3 \text{ J}$$

$$\therefore n = 6.99$$

\therefore at least 7 pushups are needed.