Problem 79

Perform the following calculations and express your answer using the correct number of significant digits. (a) A woman has two bags weighing 13.5 lb and one bag with a weight of 10.2 lb. What is the total weight of the bags? (b) The force F on an object is equal to its mass m multiplied by its acceleration a. If a wagon with mass 55 kg accelerates at a rate of 0.0255 m/s^2, what is the force on the wagon? (The unit of force is called the *newton* and it is expressed with the symbol N.)

Solution

Part (a)

All three bags are uncertain to the tenths place, so that's what the final answer is rounded to.

$$\text{Total Weight:} \quad 13.5 \text{ lb} + 13.5 \text{ lb} + 10.2 \text{ lb} = 37.2 \text{ lb}$$

This is the rule for addition and subtraction.

Part (b)

The mass only has 2 significant figures, so that's what the final answer is rounded to.

$$F = ma = (55 \text{ kg}) \left(0.0255 \frac{\text{m}}{\text{s}^2}\right) \approx 1.4 \text{ N}$$

This is the rule for multiplication and division.