Chapter 1 Problem 30 [†]

Given
$5.131022\ cm = 5.131022 \times 10^{-2}\ m$
$6.83103\ mm = 6.83103 \times 10^{-3}\ m$
$1.83104\ N$

Solution
Add the two lengths together and multiply by the force.

$$(5.131022 \times 10^{-2}\ m + 6.83103 \times 10^{-3}\ m)(1.83104\ N)$$

Before adding the two lengths write them in similar powers of ten so you are able to determine where the least significant digit is.

$$(51.31022 \times 10^{-3}\ m + 6.83103 \times 10^{-3}\ m)(1.83104\ N)$$

Notice that both of them have significant digits to the 5th decimal place when the distances are written in terms of millimeters. Therefore the summation will be accurate to the 5th decimal place.

$$(58.14125 \times 10^{-3}\ m)(1.83104\ N)$$

$$1.06458954 \times 10^{-1}\ N \cdot m$$

With the multiplication the first number has 7 significant digits and the second number has 6 significant digits. Therefore, the answer will be good to 6 significant digits. Since the 7th digit is 5 or greater, you round up. The answer is then

$$1.06459 \times 10^{-1}\ N \cdot m$$

or

$$0.106459\ N \cdot m$$

[†]Problem from Essential University Physics, Wolfson