Chapter 1 Problem 34 [†]

Given
$5.1 \times 10^{-2}\ cm = 5.1 \times 10^{-4}\ m$
$6.8 \times 10^{3}\ \mu m = 6.8 \times 10^{-3}\ m$
$1.8 \times 10^{4}\ N$

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

$$(5.1 \times 10^{-4}\ m + 6.8 \times 10^{-3}\ m)(1.8 \times 10^{4}\ N)$$

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

$$(0.51 \times 10^{-3}\ m + 6.8 \times 10^{-3}\ m)(1.8 \times 10^{4}\ N)$$

Notice the one is significant to the 1/100th place while the other is good to the 1/10th place. Therefore the summation will be accurate to the 1/10th place. This means the answer to the summation is good to 2 significant digits. An extra digit is retained at this point because we have not completed the calculation.

$$(7.31 \times 10^{-3}\ m)(1.8 \times 10^{4}\ N)$$

$$132\ N \cdot m$$

With the multiplication the first number has 2 significant digits and the second number has 2 significant digits. Therefore, the answer will be good to 2 significant digits. Since the 3rd digit is less than 5, you round down. The answer is then

$$130\ N \cdot m$$

[†]Problem from Essential University Physics, Wolfson