Weight: 145 lb
Wrist: 6.5 in.
Waist: 28 in.
Hips: 36 in.
Forearm: 10 in.

EXAMPLE 2   **Finding a Body Fat Percentage**

The human body is composed of many things including muscles, bones, internal organs, and fat. You can find your body fat percentage by dividing your body fat weight by your total body weight. You can use the following formulas to approximate your body fat percentage. (Use pounds and inches.)

Body Fat Formula for Women

Factor 1: (total body weight $\times$ 0.732) + 8.987
Factor 2: wrist circumference (at fullest point)/3.140
Factor 3: waist circumference (at naval) $\times$ 0.157
Factor 4: hip circumference (at fullest point) $\times$ 0.249
Factor 5: forearm circumference (at fullest point) $\times$ 0.434

Lean body mass = factor 1 + factor 2 − factor 3 − factor 4 + factor 5
Body fat weight = total body weight − lean body mass
Body fat percentage = (body fat weight $\times$ 100)/total body weight

Body Fat Formula for Men

Factor 1: (total body weight $\times$ 1.082) + 94.42
Factor 2: waist circumference $\times$ 4.15

Lean body mass = factor 1 − factor 2
Body fat weight = total body weight − lean body mass
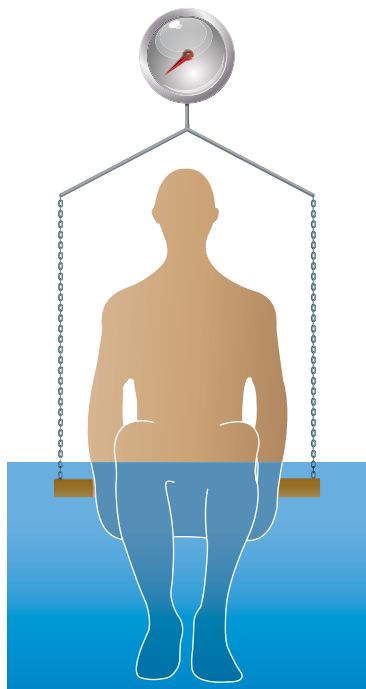Body fat percentage = (body fat weight $\times$ 100)/total body weight

Find the body fat percentage for the woman shown.

SOLUTION

Using a spreadsheet, you can see that the woman's body fat percentage is about 25.4%.

	A	B	C
1			**Factor**
2	Weight	145	115.13
3	Wrist	6.5	2.07
4	Waist	28	4.40
5	Hips	36	8.96
6	Forearm	10	4.34
7			
8	Lean body mass		108.18
9	Body fat weight		36.82
10	Body fat percentage		25.4%

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A study was conducted to determine the relationship between body fat percentage (as a percent) and body mass index (BMI), taking age and gender (males = 1, females = 0) into account. The study consisted of 521 males and 708 females, with wide ranges in BMI and age. The researchers determined that the formula for adults is

BMI = (0.83 $\times$ body fat %) − (0.19 $\times$ age) + (9 $\times$ gender) + 4.5.

Find the BMI for the 24-year-old woman in Example 2 and for a 26-year-old man who weighs 210 pounds and has a 36-inch waist.

The formulas on this page only give estimates for body fat percentage. One way to find an accurate measurement is to find your weight in and out of water.