

EXAMPLE 6 Converting Temperature Units

You remember hearing that there is one temperature that has the same degree measure in the Fahrenheit and Celsius scales. You cannot remember what the temperature is. How can you find it?

SOLUTION

One way is to use algebra. You could let $C = F$ and solve for F in the equation

$$F = \frac{9}{5}F + 32.$$

$$0 = \frac{9}{5}F - F + 32 \quad \text{Subtract } F \text{ from each side.}$$

$$0 = \frac{4}{5}F + 32 \quad \text{Combine like terms.}$$

$$-32 = \frac{4}{5}F \quad \text{Subtract 32 from each side.}$$

$$-160 = 4F \quad \text{Multiply each side by 5.}$$

$$-40 = F \quad \text{Divide each side by 4.}$$

But you may have forgotten how to solve this equation. Another instructive way to find the temperature is to use a spreadsheet.



	A	B	C
1	Celsius	Fahrenheit	
2	100	212	
3	90	194	
4	80	176	
5	70	158	
6	60	140	
7	50	122	
8	40	104	
9	30	86	
10	20	68	
11	10	50	
12	0	32	
13	-10	14	
14	-20	-4	
15	-30	-22	
16	-40	-40	
17	-50	-58	

$$(9/5) * A2 + 32$$



The temperature -40 degrees is the same on both scales.

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You are staying at a hotel in Canada. Your room feels cold, and you notice that the temperature is set at 20°C .

- What is the room temperature in degrees Fahrenheit?
- What should you set the temperature at to obtain a temperature of 77°F ?