Bug in Schaum p 96 15.28 PhL 10.23.09

The problem: suppose m = n. Then m+n = even, and integral equals 2m/0 = ∞.

Resolution: According to Maple,

```
int(sin(m*x)*cos(n*x), x = 0..Pi);
```

$$\frac{m\cos(\pi m)\cos(\pi n)+n\sin(\pi m)\sin(\pi n)-m}{(m+n)(-m+n)}$$

If m and n are both integers, we can write this as

$(m(-1)^{m+n} + 0 - m) / (n^2-m^2) = m[(-1)^{m+n} - 1] / (n^2-m^2)$

$= m[1 - (-1)^{m+n}] / (m^2- n^2)$

If m+n = even, numerator is 0. If m+n = odd, result is $2m/(m^2-n^2)$.

Amazingly Schaum has the words "odd" and "even" swapped! A web SOS website I think has just stolen its integral list from Schaum

3.

$$\int_0^\pi \sin mx \cos nx\,dx = \begin{cases} 0 & \text{if } m \text{ and } n \text{ integers and } m+n \text{ odd} \\ 2m/(m^2-n^2) & \text{if } m \text{ and } n \text{ integers and } m+n \text{ even} \end{cases}$$

and they propagate the error. I finally found a correct statement of my integral in a CRC math book I downloaded from the Russian site, to wit,

$$\textbf{607.}\ \int_0^\pi \sin ax \cos bx\,dx = \begin{cases} \dfrac{2a}{a^2-b^2}, \\ \text{or} \\ 0, \end{cases} \quad \begin{array}{l} a-b \text{ is an odd integer.} \\ \\ a-b \text{ is an even integer.} \end{array}$$