



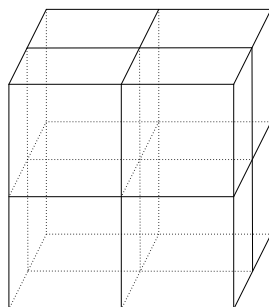
Problem of the Week

Problem C and Solution

Cubes, Cubes and More Cubes

Problem

A cube measures $10\text{ cm} \times 10\text{ cm} \times 10\text{ cm}$. Three cuts are made parallel to the faces of the cube, as shown, creating 8 identical smaller cubes. What is the difference between the surface of the 8 smaller cubes and the surface area of the original cube?



Solution

Solution 1

Each of the smaller cubes are $5\text{ cm} \times 5\text{ cm} \times 5\text{ cm}$. So each cube's surface area is $6 \times 5 \times 5 = 150\text{ cm}^2$

There are 8 small cubes so the new surface area is $8 \times 150 = 1200\text{ cm}^2$

The surface area of the larger cube is $6 \times 10 \times 10 = 600\text{ cm}^2$

So the increase in surface area is $1200\text{ cm}^2 - 600\text{ cm}^2 = 600\text{ cm}^2$

Solution 2

Each cut increases the surface area by two $10\text{ cm} \times 10\text{ cm}$ squares
or $2 \times 10 \times 10 = 200\text{ cm}^2$.

There are three cuts. So the increase in area is $3 \times 200\text{ cm}^2 = 600\text{ cm}^2$

