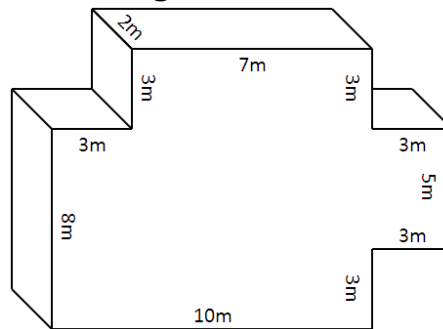


Volume and Surface Area Solutions

An underground fuel storage unit is designed as shown:



Task 1

Diesel costs around £1200 per cubic metre. Calculate how much it would cost to fill this storage unit completely.

$$\text{Cross - sectional area} = 13 \times 11 - 3 \times (3 \times 3) = 143 - 27 = 116\text{m}^2$$

$$\text{Volume} = \text{cross - sectional area} \times \text{depth} = 116 \times 2 = 232\text{m}^3$$

$$\text{At } \pounds 1200 \text{ per m}^3: 232 \times 1200 = \pounds 278,400$$

Task 2

The tank is to be constructed from sheets of stainless steel at a cost of £25 per square metre. Draw a set of scale drawings for each plate required, and calculate the total cost of the stainless steel.

For scale drawings see attached

$$116\text{m}^2 \times 2 + 6\text{m}^2 \times 6 + 10\text{m}^2 + 14\text{m}^2 + 16\text{m}^2 + 20\text{m}^2 = 328\text{m}^2$$

$$\text{At } \pounds 25 \text{ per m}^2: 328 \times 25 = \pounds 8200$$

Task 3

A welder is employed to put the tank together. He charges £30 per metre for welding stainless steel seams. Calculate the total cost of welding the tank together.

$$\text{Seams around the front face: } 7 + 3 + 3 + 5 + 3 + 3 + 10 + 8 + 3 + 3 = 48\text{m}$$

$$\text{Seams around the back face: (same as front)} = 48\text{m}$$

$$\text{Seams between front and back: } 10 \times 2\text{m} = 20\text{m}$$

$$\text{Total: } 48 + 48 + 20 = 116\text{m} \quad \text{At } \pounds 30 \text{ per metre: } 116 \times 30 = \pounds 3480$$

Plans for fuel tank

