TB(1B) Ch. 9 Areas and Volumes (I)
Conventional Questions

1. [16-17 Mid-year Exam, #11]

Figure 1 shows a rectangular tank measures 15 m by 20 m by 40 m. The tank is filled with some water.

(a) Find the capacity of the tank. **(1 mark)**

(b) When 100 metal cubes with side 3 m are put into the tank and are totally submerged in water, the water level is exactly 40 m without overflow of water. Find the height of the water level before putting 100 metal cubes into the tank. **(2 marks)**

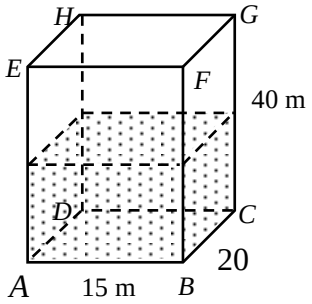


Figure 1

2. [16-17 Mid-year Exam, #12]

Figure 2 shows a prism of height 25 cm and base $ABCDEF$. $AB = x$ cm, $DE = 6$ cm, $EF = 12$ cm and $AF = 12$ cm.

(a) Find the perimeter of the base. **(1 mark)**

(b) Express the base area in terms of x. **(2 marks)**

(c) If the volume of the prism is 2100 cm^3, find the total surface area of the prism. **(3 marks)**

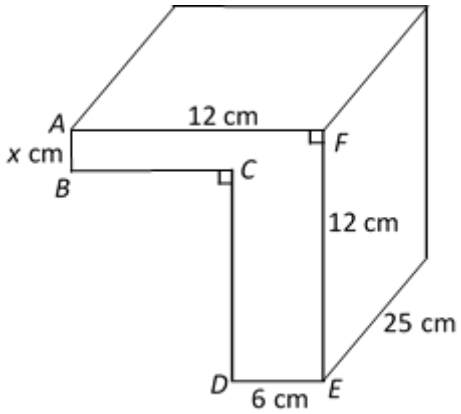


Figure 2

3. [16-17 Final Exam, #9]

Amy wants to design a solid which is in the shape of a right prism as shown in **Figure 2**. The uniform cross-section surface is made up of a trapezium and a square. It is given that the height of the trapezium is h cm and the total surface area of the solid is 178 cm^2.

(a) Find the perimeter of the uniform cross-section. **(1 mark)**

(b) Find the volume of the solid. **(3 marks)**

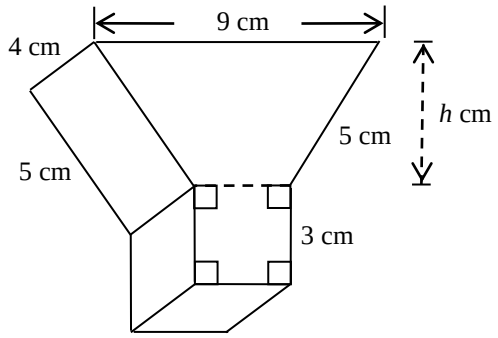


Figure 2

4. [17-18 Standardized Test 2 Q3]

Figure 3 shows two containers, a cuboid and a prism. The base of the prism is a trapezium. It is known that the capacity of the prism is twice the cuboid.

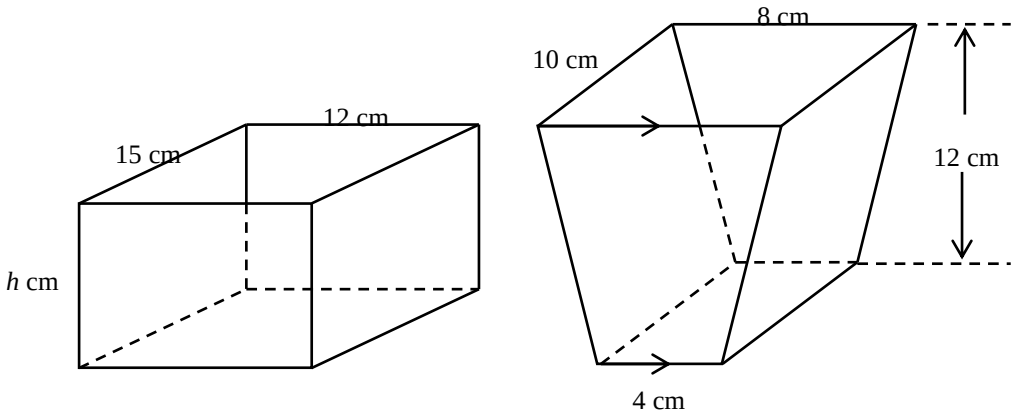


Figure 3

(a) Find the capacity of the prism. **(2 marks)**

(b) Find the value of h. **(2 marks)**

5. [17-18 Final Exam Q12]

In **Figure 8**, a metal solid rectangular block is melted and recast to form a triangular prism.

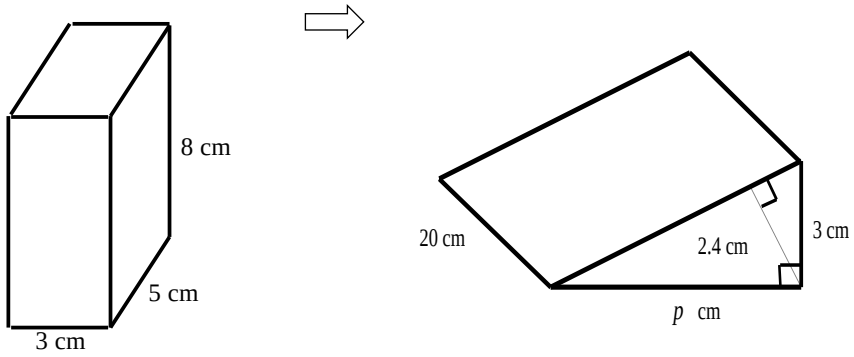


Figure 8

(a) Find the value of p. **(2 marks)**

(b) Find the total surface area of the triangular prism. **(3 marks)**

6. [18-19 Standardized Test 2 Q2]

A block of chocolate cuboid of dimension 15 cm × 18 cm × 20 cm is melted and moulded into N pieces of smaller chocolate cuboids of dimension 3 cm × 3 cm × 4 cm.

(a) Write down the value of N. **(1 mark)**

(b) Find the total surface area of all the smaller chocolate cuboids. **(2 marks)**

7. [18-19 Standardized Test 2 Q4]

Figure 2 shows a triangular prism of total surface area 420 cm^2.

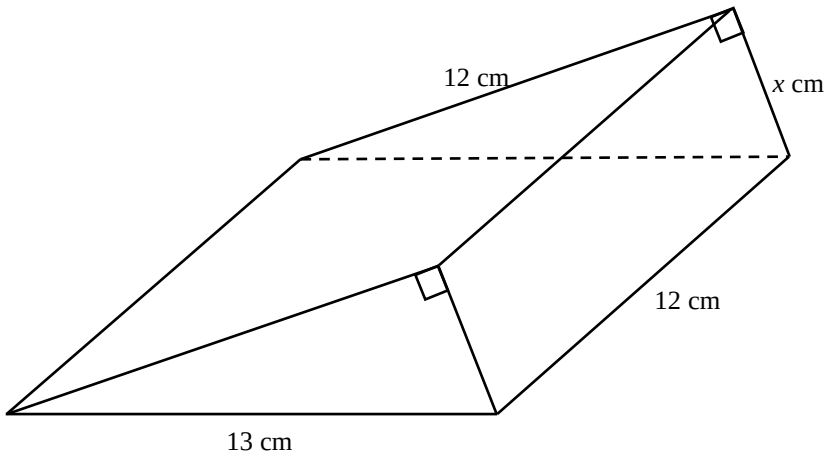


Figure 2

(a) Express the perimeter and the area of the uniform cross-section of the prism in terms of x. **(2 marks)**

(b) Hence, find the volume of the prism. **(2 marks)**

8. [18-19 Final Exam Q10]

In **Figure 5**, *ABCFDE* is a triangular prism. It is given that $AB = p$ cm, $AG \perp CB$ and the volume of this prism is 108 cm^3.

(a) Find *AG*. **(2 marks)**

(b) It is given that the total surface area of the triangular prism is 168 cm^2. Find *p*. (**2 marks)**

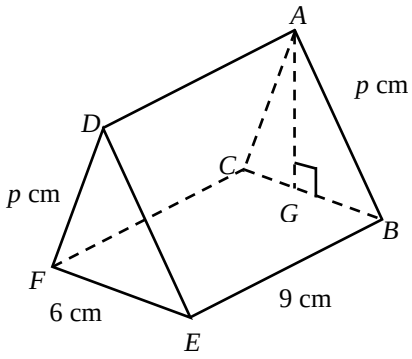
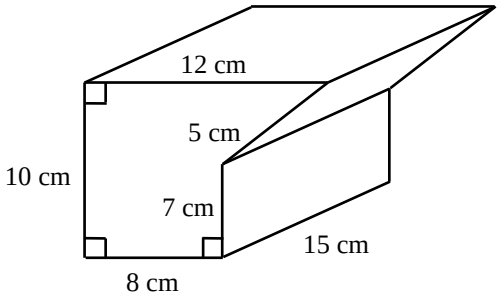


Figure 5

9. [20-21 Final Exam Q10]

Find the total surface area of the right prism in **Figure 4**. **(3 marks)**



10. [20-21 Final Exam Q20]

Figure 9a shows a closed container in the shape of right triangular prism with a right-angled triangle base which contains 1080 cm^3 of water.

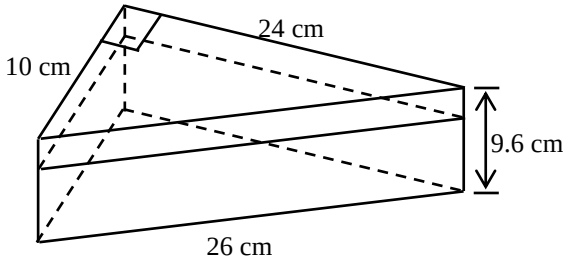


Figure 9a

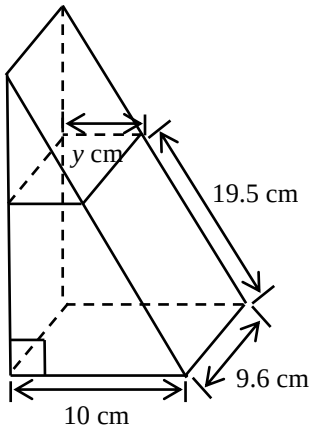


Figure 9b

(a) Find the depth of water in **Figure 9a**. **(2 marks)**

(b) Now the container is put vertically as shown in **Figure 9b**. The depth of water is doubled. Find the value of y. **(2 marks)**

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