

1. Ravi is an avid book reader. Over the years, he has collected a vast collection of books, but his small study room is running out of space. To keep his books organized, he decides to build a wooden storage box to store some of his favourite books. He designs a cuboidal box with dimensions $12\text{ cm} \times 8\text{ cm} \times 6\text{ cm}$. However, before making the box, he wants to calculate its storage capacity and surface area to determine the amount of wood required. Additionally, he considers making the box taller to fit more books.



On the basis of above information, answer the following questions:

(i) Which formula is used to calculate the volume of a cuboid

(a) $2(lb + bh + hl)$

(b) $l + b + h$

(c) $l \times b \times h$

(d) $\frac{1}{2} lbh$

(ii) What is the volume (storage capacity) of the cuboidal box?

(a) 576 cm^3

(b) 288 cm^3

(c) 672 cm^3

(d) 480 cm^3

(iii) What is the total surface area of the box?

(a) 336 cm^2

(b) 288 cm^2

(c) 480 cm^2

(d) 432 cm^2

(iv) If Ravi increases the height of the box from 6 cm to 10 cm, what will be the new volume?

(a) 960 cm^3

(b) 720 cm^3

(c) 840 cm^3

(d) 480 cm^3

(v) By how much does the volume increase when the height becomes 10 cm?

(a) 240 cm^3

(b) 384 cm^3

(c) 320 cm^3

(d) 200 cm^3

(vi) Which dimension affects the storage capacity directly?

(a) Only length

(b) Only breadth

(c) Only height

(d) Length, breadth, and height

(vii) If only the height is doubled, the volume of the box will:

(a) Remain same

(b) Become half

(c) Become double

(d) Become triple

2. Rohit is helping his father who is a craftsman designing wooden frames .They are working on a rectangular-shaped frame whose sides are represented by the algebraic expressions $(x+5)$ m and $(x-3)$ m respectively

Based on above information ,answer the following questions

(i) Which of the following expressions represents the area of the rectangular frame?

(a) $2x + 2$

(b) $x^2 + 2x - 15$

(c) $x^2 - 15$

(d) $x^2 + 8x + 15$

(ii) If Rohit needs to find the total length of the wood required for the boundary (perimeter), which expression should he use?

(a) $2x + 2$

(b) $x + 2$

(c) $4x + 4$

(d) $4x + 2$

(iii) If the value of x is 10 meters, what is the actual length of the longer side?

(a) 5 m

(b) 7 m

(c) 15 m

(d) 10 m

(iv) What is the difference between the length and the width of the frame?

(a) 2 m

(b) 8 m

(c) $(2x + 2)$ m

(d) $(x^2 - 15)$ m

(v) If $x = 7$, what is the area of the frame?

(a) 48 m^2

(b) 60 m^2

(c) 96 m^2

(d) 120 m^2

(vi) If the area of the frame is 20 square meters, which quadratic equation would you solve to find x ?

(a) $x^2 + 2x - 35 = 0$

(b) $x^2 + 2x - 15 = 0$

(c) $x^2 - 15 = 20$

(d) $x^2 + 2x + 5 = 0$

(vii) If Rohit decides to double the length of the frame while keeping the width the same, what is the new expression for the length?

(a) $x + 10$

(b) $2x + 5$

(c) $2x + 10$

(d) $x^2 + 10x + 25$