Bank Job Lecture Sheet

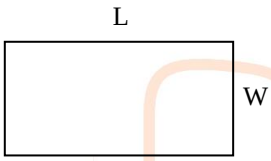
Lecture 11

Lecture Contents

☑ **Geometry (Quadrilateral)**

Geometry (Quadrilateral)

চারটি বাহু দ্বারা ক্ষেত্রকে চর্তুভুজ বলে । মোট ৫টি ।



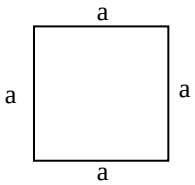
(i) **Rectangle (আয়তক্ষেত্র):** বিপরীত বাহুগুলো সমান ও সমান্তরাল এবং প্রত্যেকটি কোণ 90° তাকে আয়তক্ষেত্র বলে ।

Area = L × W
Diagonal (কর্ণ) = $\sqrt{L^2 + W^2}$
Perimeter = 2 (L + W)

Length = L
Width বা Breath = W

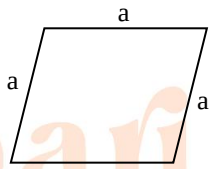
(ii) **Parallelogram (সামন্তরিক):** বিপরীত বাহুগুলো সমান ও সমান্তরাল এবং প্রত্যেকটি কোণ 90° নয়, তাকে সামন্তরিক বলে ।

Area = Base × Height



(iii) **Square (বর্গক্ষেত্র):** চারটি বাহু সমান এবং প্রত্যেকটি কোণ 90° তাকে বর্গক্ষেত্র বলে ।

Area = a × a = a^2
Diagonal = $\sqrt{a^2 + a^2} = \sqrt{2a^2} = \sqrt{2}\,a$
Perimeter = 4a



(iv) **Rhombus (রম্বস):** চারটি বাহু সমান কিন্তু প্রক্যেটি কোণ 90° নয় তাকে Rhombus বলে ।

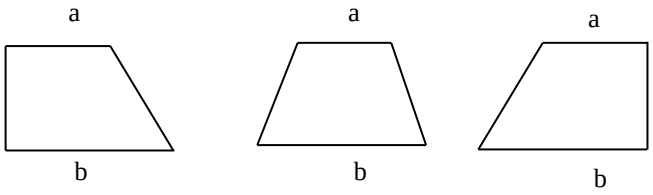
Area = $\frac{1}{2}$ × কর্ণদ্বয়ের গুণফল

= $\frac{1}{2}$ × Product of two diagonals

Perimeter = 4a

Note: রম্বসের কর্ণদ্বয় পরস্পরকে সমকোণে সমদ্বিখ-িত করে ।

(v) **Trapezium (ট্রাপিজিয়াম):** যে চতুর্ভুজের দুটি বাহু সমান্তলাল তাকে ট্রাপিজিয়াম বলে ।



Area = $\frac{1}{2}$ × সমান্তরাল বাহুদ্বয়ের যোগফল × উচ্চতা

$= \frac{1}{2} \times (a + b) \times h$

Teacher's Discussion

1. **If the length of each of the sides of three-square garden's plots is increased by 50 percent, by what percent is the sum of the areas of the three plots increased? [**ICB Asst. Programmer- 2017**]**

   A. 125% B. 150% C. 200% D. 375% **Ans:** A

2. **It requires Taka 20 for fencing 1 meter. How much will it cost to fence a plot having length of 30 meters and breadth of 10 meters? [**Combined 5 Banks Officer- 2022**]**

   A. Tk. 600 B. Tk. 3000 C. Tk. 6000 D. Tk. 1600 **Ans:** D

3. **If the base of a parallelogram is 8 and the height is 7 and perimeter is 24, what is the area of the parallelogram? [**Combined 5 Banks Officer- 2022**]**

   A. 32 B. 96 C. 66 D. 56 **Ans:** D

4. **A rectangular floor that measures 8 meters by 10 meters is to be covered with carpet that each measure 2 meters by 2 meters. If the carpet cost Tk. 12 a piece, what is the total cost to cover the floor? [**Combined 9 Banks Officer- 2022**]**

   A. Tk. 200 B. Tk. 240 C. Tk. 480 D. Tk. 960 **Ans:** B

5. **The ratio of the length to the width of a rectangular advertising display is approximately 3.3 to 2. If the width of the display is 8 meters, what is the approximate length of the display, in meters? [**Combined 9 Banks Officer- 2022**]**

   A. 7 B. 11 C. 13 D. 16 **Ans:** C

6. **The area of the floor of an auditorium is 600 sq. meter. How many unbroken tiles of dimension 10 × 30 cm will be required to cover the floor completely?** [Combined 9 Bank Senior Officer (General)-2023]

   A. 200 B. 15000 C. 10000 D. 20000 **Ans: D**

7. **The perimeter of a rectangle is 20cm. If the length of the rectangle is 6 cm, then the breadth will be-** [Combined 9 Bank Senior Officer (General)-2023]

   A. 4 cm B. 6 cm C. 10 cm D. 14 cm **Ans: A**

8. **The area of a rhombus is 96 cm^2 and the length of one of the diagonals is 16 cm. The length of the other diagonal is- [**Combined 7 Banks Senior Officer- 2021**;** Bangladesh Bank AD- 2018]

   A. 18 B. 12 C. 9 D. 6 **Ans:** B

9. **The width of a rectangle is 20 cm. The diagonal is 8 cm more than the length. Find the length of the rectangle. [**Bangladesh Bank AD- 2021**]**

   A. 20 B. 23 C. 22 D. 21 **Ans:** D

10. **The perimeter of a rectangle is 104 inches. The width is 6 inches less than 3 times the length. Find the width of the rectangle. [**Bangladesh Bank AD- 2021**]**

    A. 13.5 inches B. 37.5 inches C. 14.5 inches D. 15 inches **Ans:** B

11. **The area of a rectangular classroom is $x^2 - 25$. Which of the following binomials could represent the length and the width of the room?** [Bangladesh Bank AD- 2021]

A. $(x + 5)(x + 5)$ B. $(x - 5)(x - 5)$ C. $(x + 5)(x - 5)$ D. $x(x - 25)$ **Ans:** C

12. **The breadth of a rectangular field is 60% of its length. If the perimeter of the field is 800 m, what is the area of the field?** [Bangladesh Bank Officer- 2016]

A. 35700 sq. m B. 40000 sq. m C. 48000 sq. m D. 18750 sq. m **Ans:** A

13. **A rectangle is 14 cm long and 10 cm wide. If the length is reduced by x cms and its width is increased also by x cms so as to make it a square, then its area changes by:** [Bangladesh Bank AD- 2018]

A. 4 B. 144 C. 12 D. 2 **Ans:** A

14. **The diagonal of a square is 2 cm. If a circle is inscribed in that square, what will be the area of that circle?**

A. $\frac{\pi}{4}$ cm^2 B. $\frac{\pi}{2}$ cm^2 C. $\frac{\pi}{8}$ cm^2 D. 4π cm^2 **Ans:** B

15. **Forty tiles of dimensions 1 foot × 2 foot each are required to completely cover a floor. How many titles of dimensions 2 foot × 4 foot each would be required to completely cover the same floor?** [Dutch Bangla Bank, PO- 2019]

A. 10 B. 20 C. 80 D. 160 **Ans:** A

16. **Tk. 2496 is spent in the floor repair 30 × 16 ft. Floor. What is the repair cost per square feet?** [IFIC Bank TSO- 2019]

A. 5.20 B. 78.00 C. 12.48 D. 52.00 **Ans:** A

17. **The length of a rectangular room is double of its breadth. If the area is 512 square inches, what is the perimeter (in feet)?** [Uttara Bank, AO- 2022]

A. 4 B. 6 C. 8 D. 12 **Ans:** C

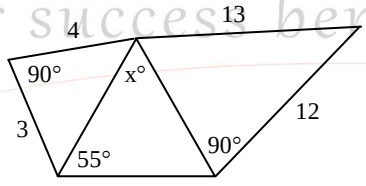
18. **A rectangular field will be fenced on three sides leaving a side of 20 feet unconvered. If the area of the field is 680 square feet, how many feet of fencing will be required?** [Uttara Bank AO- 2022]

A. 88 B. 34 C. 40 D. 68 **Ans:** A

19. **Rahim wants to cut a rectangular board into identical square pieces. If the board is 18 inches by 30 inches, what is the least number of square pieces he can cut without wasting any of the board?** [Global Islami Bank, PO- 2022]

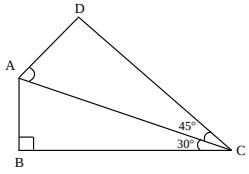
A. 4 B. 6 C. 9 D. 15 **Ans:** D

20. **In the figure above, what is the value of x?**



(A) 55 (B) 60 (C) 65 (D) 70 **Ans:** D

21. **In the figure below, if BC = $\sqrt{6}$. What is the value of CD?**



(A) 2 (B) 4 (C) $\sqrt{2}$ (D) $2\sqrt{3}$ **Ans:** C

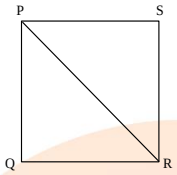
22. What is the exact area (in square inch) of a square whose diagonal is 8 inches?

(A) $8\sqrt{2}$ (B) $16\sqrt{2}$ (C) $32\sqrt{2}$ (D) 32 **Ans:** D

23. The longest side of an isosceles right triangle measures 16m. What is the perimeter of the triangle?

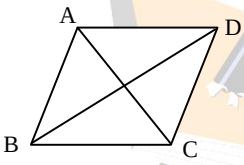
(A) 32 2 m (B) $32 + 16\sqrt{2}$ m (C) $16 + 16\sqrt{2}$ m (D) $32 + \sqrt{2}$ m **Ans:** C

24. If a square region PQRS has an area of 2 square feet, what is the length of its diagonal (PR)?



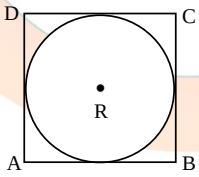
(A) 4 feet (B) 2 feet (C) 8 feet (D) $2\sqrt{2}$ feet **Ans:** B

25. The rhombus ABCD has diagonals intersecting at X, with BC = 13 cm and CX = 5 cm. Calculate the area of the rhombus cm^2



(A) 65 (B) 90 (C) 120 (D) 130 **Ans:** C

26. If the area of the circle R is a, then the area of the square ABCD in the figure above is:



(A) πa^2 (B) a^2 (C) $\frac{4a}{\pi}$ (D) $\frac{4a^2}{\pi}$ **Ans:** C

27. The area of a rectangle R with width 4 ft is equal to the area of a square S, which has a perimeter of 24 ft. The perimeter of the rectangle R, in feet, is-

(A) 9 (B) 16 (C) 24 (D) 26 **Ans:** ==

28. A farmer has two rectangular fields. The larger field has twice the length and four times the width of the smaller field. If the smaller field has area K, then the area of the larger field is greater than the area of the smaller field by what amount?

(A) 2K (B) 5K (C) 6K (D) 7K **Ans:** D

29. If a square region has area n, what is the length of the diagonal of the square in terms of n?

(A) $\sqrt{2n}$ (B) $\sqrt{n}$ (C) $2\sqrt{n}$ (D) 2n **Ans:** A

30. The side length of a square inscribed in a circle is 2. What is the area of the circle?

(A) π (B) $\sqrt{2\pi}$ (C) 2π (D) $2\sqrt{2\pi}$ **Ans:** C

Student's Drill

1. **The diagonal of a rectangle is $\sqrt{41}$ cm and its area is 20 sq. cm. The perimeter of the rectangle must be:**
   (A) 9cm (B) 18cm (C) 20cm (D) 41cm **Ans:** B

2. **The difference between the length and breadth of a rectangle is 23 m. If its perimeter is 206 m, then its area is:**
   (A) $1520m^2$ (B) $2420m^2$ (C) $2480m^2$ (D) $2520m^2$ **Ans:** D

3. **A picture in an art museum is 6 feet wide and 8 feet long. If its frame has a width of 6 inches, what is the ratio of the area of the frame to the area of the picture?**
   (A) $\frac{5}{16}$ (B) $\frac{5}{4}$ (C) $\frac{4}{5}$ (D) $\frac{5}{12}$ **Ans:** A

4. **A certain triangle has sides that are respectively 6, 8 and 10 inches long. A rectangle equal in area to that of the triangle has a width of 3 inches. What is the perimeter of the rectangle?**
   (A) 11 (B) 16 (C) 22 (D) 24 **Ans:** C

5. **The length of a rectangle is 16 feet longer than its breadth. Given that its perimeter is 152 feet, what is the breadth of the rectangle in feet?**
   (A) 12 (B) 24 (C) 30 (D) 20 **Ans:** C

6. **A picture is copied onto a sheet of paper, which measures 8.5 inches by 10 inches. A border of 1.5 inch is left all around. What is the area, in square inches, covered by the picture?**
   (A) 76 (B) 65 (C) 38.5 (D) 59.5 **Ans:** C

7. **The area of a rectangle is 460 square metres. If the length is 15% more than the breadth, what is the breadth of the rectangular field?**
   (A) 15 metres (B) 26 metres (C) 34.5 metres (D) 20 metres **Ans:** D

8. **The area of a rectangular field is 1,000 square meters. If the length of the field is 40 meters, what is the perimeter of the field in square meters?**
   (A) 25 (B) 135 (C) 165 (D) 130 **Ans:** D

9. **How many squares of 2 inch dimension will be required to cover a rectangle of 8 inch breadth and 6 inch length?**
   (A) 7 (B) 24 (C) 12 (D) none of these **Ans:** C

10. **The length of a rectangular field is four times its width. If the cost of cultivating the field at Tk. 20 per square meter is Tk. 1,280 then what is the perimeter, in meters, of the rectangular field?**
    (A) 32 (B) 64 (C) 20 (D) 40 **Ans:** D

11. **The sides of a rectangular floor are 16 feet by 24 feet. When a rectangular carpet is placed on the floor, a 4 feet wide strip of floor is exposed on all sides. What is the area of the carpet in sq. ft?**
    (A) 320 (B) 128 (C) 352 (D) 240 **Ans:** B

12. **A rectangular plot 50 feet by 100 feet is surrounded on all sides by a concrete walk 5 feet wide. Find the number of square feet in the surface of the walk.**
    (A) 160 (B) 1600 (C) 1000 (D) 1500 **Ans:** B

13. The length of a rectangle is 7 more than its width. If the perimeter of the rectangle is the same as the perimeter of a square of side 8.5, what is the length of a diagonal of the rectangle?

(A) 12 (B) 13 (C) 23 (D) 31 **Ans:** B

14. The ratio between the perimeter and the breadth of a rectangular is 5 : 1. If the area of the rectangle is 216 cm, what is the length of the rectangle?

(A) 16 cm (B) 18 cm (C) 20 cm (D) 22 cm **Ans:** B

15. If the perimeter of a certain rectangle is 76m and its area is 360m^2, then what is the length of its shortest side?

(A) 18 (B) 15 (C) 13 (D) 10 **Ans:** A

16. The length of a rectangular plot is 20 meters more than its breadth. If the cost of fencing the plot at 26.50 per meter is Tk. 5300, what is the length of the plot in meters?

(A) 50 m (B) 55 m (C) 58 m (D) 60 m **Ans:** D

17. How many bricks, each measuring 25cm x 11.25cm x 6cm, will be needed to build a wall of 8m x 6m x 22.5m?

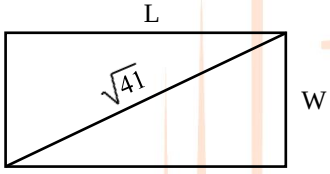
(A) 5600 (B) 6000 (C) 640000 (D) 7200 **Ans:** C

18. The difference between the length and the breadth of a blackboard is 8 cm. If the breadth is decreased by 4 cm and the length is increased by 7 cm, the area remains the same. Find the dimension of the blackboard?

(A) 30, 22 (B) 28, 20 (C) 34, 26 (D) 56, 48 **Ans:** B

Solution of Student's Drill

1. **Solution:**



$LW = 20$

$L^2 + W^2 = (\sqrt{41})^2$

$\Rightarrow (L + W)^2 - 2LW = 41$

$\Rightarrow (L + W)^2 = 81$

$\Rightarrow L + W = 9$

$\therefore L - W = \sqrt{(L - W)^2}$

$= \sqrt{(L + W)^2 - 4LW}$

$= \sqrt{9^2 - 4 \times 20}$

$= \sqrt{1}$

$\therefore L + W = 9$

$\Rightarrow L - W = 1$

$\Rightarrow L = \frac{9 + 1}{2} = 5$

$\Rightarrow W = \frac{9 - 1}{2} = 4$

$\therefore$ পরিসীমা $= 2(5 + 4) = 18$ **(Ans.)**

2. **Solution:**

$L - W = 23$

$2 (L + W) = 206$

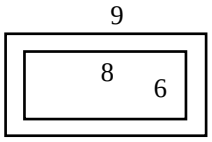
$\Rightarrow L + W = 103$

$\therefore L = \frac{103 - 23}{2} = 63$

$W = \frac{103 - 23}{2} = 40$

$LW = 63 \times 40 = 2520$ **(Ans.)**

3. **Solution:**

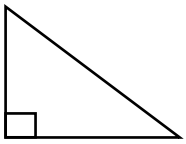


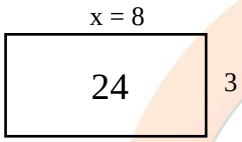
6 inch = .5 feet

$$\frac{\text{Area (Frame)}}{\text{Area (Pic)}} = \frac{9 \times 7 - 8 \times 6}{8 \times 6}$$

$$= \frac{63 - 48}{48} = \frac{15}{48} = \frac{5}{16}$$ **(Ans.)**

4. **Solution:**

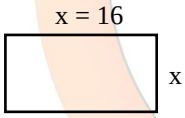




$\Delta = \frac{1}{2} \times 6 \times 8 = 24$

$\therefore$ P = 2(8 + 3) = 22 **(Ans.)**

5. **Solution:**

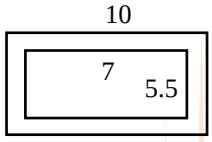


2(x + x + 16) = 152

$\Rightarrow$ 2x + 16 = 76

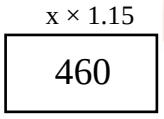
$\Rightarrow$ 2x = 60 $\therefore$ x = 30 **(Ans.)**

6. **Solution:**



Area (pic) = 7 × 5.5 = 38.5 **(Ans.)**

7. **Solution:**

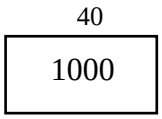


1.15x × x = 460

$\Rightarrow x^2 = \frac{460 \times 100}{1.15} = 400$

$\Rightarrow x = \sqrt{400} = 20$ **(Ans.)**

8. **Solution:**

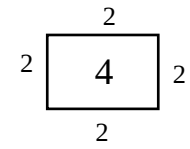


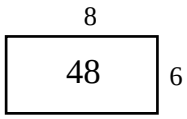
LW = 1000

$\Rightarrow W = \frac{1000}{40} = 25$

$\therefore$ Peri = 2(40 + 25) = 130 **(Ans.)**

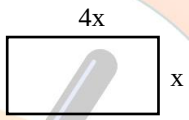
9. **Solution:**





$\frac{48}{4} = 12$ **(Ans.)**

10. **Solution:**

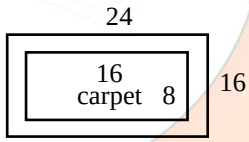


$4x^2 \times 20 = 1280$

$\Rightarrow x^2 = 16$ $\therefore$ x = 4

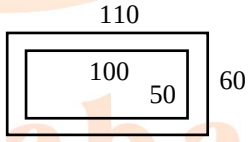
$\therefore$ Peri = 2(16 + 4) = 40 **(Ans.)**

11. **Solution:**



Area (carpet) = 16 × 8 = 128 **(Ans.)**

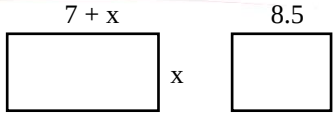
12. **Solution:**



Area of walk = 110 × 60 – 100 × 50

= 6600 – 5000 = 1600 **(Ans.)**

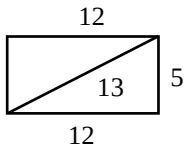
13. **Solution:**



$\therefore$ 2(7 + x +) = 4 × 8.5

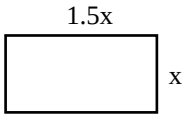
$\Rightarrow$ 7 + 2x = 17

$\Rightarrow$ 2x = 10 $\therefore$ x = 5



Ans: 13

14. **Solution:**



$1.5x \times x = 216$

$\Rightarrow x^2 = \frac{216 \times 10}{15}$

$\Rightarrow x^2 = 144 \quad \therefore x = 12$

$\therefore$ length $= 1.5x = 1.5 \times 12 = 18$ **(Ans.)**

15. **Solution:**

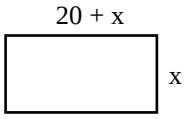
$2 (L + W) = 76$

$\Rightarrow L + W = 38$

$\therefore 20 \times \boxed{18} = 360$

Ans: 18

16. **Solution:**



$2(20 + x + x) = 200$

$\Rightarrow 20 + 2x = 100$

$\Rightarrow 2x = 80 \Rightarrow x = 40$

$\therefore L = 20 + 40 = 60$

$W = 40$; Area $= 60 \times 40 = 2400$

$\therefore$ Total cost $= 2400 \times 20$

$= 48000$ Tk. **(Ans.)**

17. **Solution:**

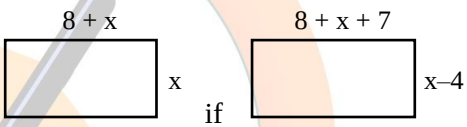
No. of bricks

$= \frac{8 \times 100\text{cm} \times 6 \times 100\text{cm} \times 22.5 \times 100\text{cm}}{25\text{cm} \times 11.25\text{ cm} \times 6\text{cm}}$

$= \frac{800 \times 600 \times 2250 \times 100}{25 \times 1125 \times 6}$

$= 640000$ **(Ans.)**

18. **Solution:**



$\therefore x \times (8 + x) = (8 + x + 7)(x - 4)$

$\Rightarrow x^2 + 8x = 13x - 60 + x^2 - 4x$

$\Rightarrow 8x = 11x - 60 = 60$

$\therefore 3x = 60 \Rightarrow x = 20$

$\therefore$ Dimension of the blackboard = 28, 20 **(Ans.)**

Home Practice

1. The perimeter of a rectangle is 40. One of the sides is 5. Find the lengths of the other sides.

A. 10, 10, 10 B. 5, 10, 10 C. 5, 15, 15 D. 10, 15, 15 **Ans:** C

2. The length of a plot is 80 m. and the breadth are 60 m. A pond was excavated in the plot. If the width of each side of the border around the pond is 4 meters, determine the area of the border of the pond. [BUP (FBS): 2021-22]

A. 1000 m^2 B. 1056 m^2 C. 1028 m^2 D. 1065 m^2 **Ans:** B

3. The length of rectangle ABCD is $\frac{6}{5}$ th of its breadth. Its perimeter is 132. What is its area? [BUP (FBS): 2021-22]

A. 660 m^2 B. 2210 m^2 C. 2160 m^2 D. 1080 m^2 **Ans:** D