Mensuration Most Asked Common Questions (Last 5 years)

Q1. The difference between Circumference of circle A and diameter is 90 cm . If Radius of Circle B is 7 cm less than circle A, then find area of Circle B?
(a) 556 cm²
(b) 616 cm²
(c) 588 cm²
(d) 532 cm²
(e) 630 cm²

Q2. Ratio of length to breadth of a rectangle is 4:3. If the area of that rectangle is 108 cm² and breadth of this rectangle is equal to the side of a square then find the area of that square.
(a) 49 cm²
(b) 100 cm²
(c) 64 cm²
(d) 81 cm²
(e) 121 cm²

Q3. Area of rectangle is 144 cm² length of rectangle is 10 cm more the breadth of that. Find the perimeter of the rectangle.
(a) 62 cm
(b) 54 cm
(c) 56 cm
(d) 52 cm
(e) None of these

Q4. A rectangular path of width 3m is surrounding the garden whose length is 3m more than its width. If cost of painting the path at rate of 0.5Rs/m² is Rs 273 then find the area of garden
(a) 1525m²
(b) 1804 m²
(c) 1776 m²
(d) 1906 m²
(e) 1664 m²

Q5. Ratio of base and perpendicular side of a right-angled triangle is 3:4 and its base is equal to the side of a square having area 81 cm². Find the perimeter of the triangle?
(a) 30 cm
(b) 36 cm
(c) 33 cm
(d) 42 cm
(e) 40 cm

Q6. If length of a rectangle increases by 40% while keeping breadth constant then area of rectangle increased by 24 m² and perimeter of original rectangle is 32 m. find breadth of rectangle.
(a) 8.4 m
(b) 10 m
(c) 6 m
(d) 14 m
(e) 8 m

Q7. The area of a rectangle is equal to the area of a square whose diagonal is $4\sqrt{6}$ cm. If the ratio of the length and width of the rectangle is 4:3, then find the perimeter of the rectangle?
(a) 20 cm
(b) 16 cm
(c) 28 cm
(d) 24 cm
(e) 32 cm

Q8. The perimeter of semicircle is 36 cm and the radius of the semicircle is equal to the breath of a rectangle. If area of rectangle is 147 cm², then find the length of rectangle?
(a) 10.5 cm
(b) 28 cm
(c) 14 cm
(d) 21 cm
(e) 35 cm

Q9. The length of a rectangle is 12 cm and the side of a square is 14 cm less than the sum of the length and breadth of the rectangle. If the perimeter of the rectangle is 16 cm more than the perimeter of the square, then find the breadth of the rectangle.
(a) 6 cm
(b) 10 cm
(c) 8 cm
(d) 4 cm
(e) 5 cm

Q10. If the ratio of side of square and the radius of the circle is X+3: X and the radius of the circle is 14cm, which is half of the side of the square. Find the perimeter of the square whose side is 3X cm.
(a) 112
(b) 48
(c) 36
(d) 56
(e) 78

Q11. The radius of a circle is 7 cm and the perimeter of a square having side of (x+5) cm is $\frac{9}{11}$th of the circumference of the circle. Find the area of another square whose side is x cm.
(a) 64 cm²
(b) 16 cm²
(c) 25 cm²
(d) 36 cm²
(e) 9 cm²

Q12. The area of right-angled triangle is 182 cm². If the ratio of base to height is 7: 13, then find height of the triangle.
(a) 39 cm
(b) 42 cm
(c) 65 cm
(d) 55 cm
(e) 52 cm

Q13. The ratio of length to breadth of a rectangle is 4 : 3 and area of the rectangle is 300 cm square. If the breadth of rectangle decreased by 20% and the length is increased by 10%, then find the new perimeter (in cm) of the rectangle?
(a) 68
(b) 70
(c) 60
(d) 84
(e) 48

Q14. The side of a square is 'l + 4' cm, whose area is twice the area of a right-angle tringle. If the base and height of the triangle are 'l+1' cm and 'l+8' cm, respectively, then find the base of the triangle.
(a) 8 cm
(b) 10 cm
(c) 12 cm
(d) 16 cm
(e) 9 cm

Q15. The area of a rectangular field having length 128 m and breadth 16m is equal to the area of an isosceles right-angle triangle. If the radius of a sphere is $12\frac{1}{2}\%$ of the hypotenuse of the isosceles right-angle triangle, then find out the total surface area of sphere?
(a) 512π m²
(b) 343π m²
(c) 580π m²
(d) 494π m²
(e) 500π m²

Q16. If ratio between volume of a cylinder and volume of sphere is 3 : 1, then find the ratio between total surface area of cylinder to total surface area of sphere [Radius of sphere = Radius of cylinder]
(a) 2 : 1
(b) 5 : 2
(c) 4 : 1
(d) 3 : 2
(e) 7 : 2

Q17. Radius of a cone is equal to the side of an equilateral triangle having area $49\sqrt{3}$ cm². and the slant height of the cone is 8 cm more than the perimeter of triangle then find the volume of the cone.
(a) 9646 cm³
(b) 9586 cm³
(c) 9716 cm³
(d) 9856 cm³

Q18. A circle is inscribed in an equilateral triangle whose height is $3\sqrt{3}$ cm. Then, find the ratio of area of equilateral triangle to area of circle inscribed in an equilateral triangle.
(a) $3\sqrt{3} : 4$
(b) $4 : 3\sqrt{3}$
(c) $5\sqrt{2} : 7\sqrt{3}$
(d) Cannot be determined.
(e) None of the above.

Solutions

S1. Ans.(b)
Sol. Let radius of circle A be r cm
ATQ
$2\pi r - 2r = 90$
$r = 21\ cm$
Radius of circle B=14 cm
Area of circle B= 616 cm²

S2. Ans.(d)
Sol. Let the length and breadth of that rectangle be 4x and 3x cm respectively
ATQ
$4x \times 3x = 108$
$x = 3\ cm$
Breadth=9 cm
Area of square= 81 cm²

S3. Ans.(d)
Sol. Let length = x
So, breadth = $x - 10$
Now,
$x(x - 10) = 144$
Solving $x = 18$ = length
Breadth = 8
Perimeter = $(18 + 8) \times 2 = 52$ cm

S4. Ans.(b)
Sol. Let width of garden = a m
So length of garden = (a +4) m
According to question
$(x + 6)(x + 9) - x(x + 3) = \frac{273}{0.5}$
$x^2 + 15x + 54 - x^2 - 3x = 546$
$12x + 54 = 546$
$x = 41$
Area of garden = 41 × 44
= 1804 m^2

S5. Ans.(b)
Sol. Side of the square=9 cm
Perpendicular side of the triangle= 12 cm
Hypotenuse of the triangle=$\sqrt{81 + 144} = \sqrt{225} = 15\ cm$
Perimeter of the triangle= 36 cm

S6. Ans.(c)
Sol. let length & breadth of rectangle be x & y m respectively
ATQ, 1.4xy – xy = 24
xy = 60 ....(i)
also, 2(x + y) = 32
x + y = 16 ....(ii)
from (i) & (ii)
x = 10 m, y = 6 m
breadth of rectangle = 6 m

S7. Ans.(c)
Sol. Let us assume the side of square is a cm.
ATQ, $a\sqrt{2} = 4\sqrt{6}$
a = $4\sqrt{3}$ cm
Let us assume that the length and width of the rectangle are 4x cm and 3x cm respectively.
ATQ, $4x \times 3x = (4\sqrt{3})^2$
x = 2 cm
So, Perimeter of rectangle = 2(4x+3x) = 28 cm.

S8. Ans.(d)
Sol. πr + 2r = 36

$\frac{22}{7} \times r + 2r = 36$

r = 7 cm

Length of rectangle = $\frac{147}{7} = 21$ cm

S9. Ans.(c)
Sol. Let the breadth of the rectangle be 'b' cm

And side of the square = $((12 + b) - 14)$ cm

ATQ,

$2(12 + b) - 4((12 + b) - 14) = 16$

$24 + 2b - 4(b - 2) = 16$

$24 + 2b - 4b + 8 = 16$

$32 - 2b = 16$

$2b = 16$

$b = 8$

S10. Ans.(c)
Sol. Radius of the circle = 14 cm

Side of the square = 28

ATQ,

$\frac{X+3}{X} = \frac{28}{14}$

X + 3 = 2X

X = 3

Required perimeter = $4 \times 3 \times 3 = 36 \, cm$

S11. Ans.(b)
Sol. circumference of the circle = $2 \times \frac{22}{7} \times 7 = 44$

ATQ, 4x + 20 = $44 \times \frac{9}{11}$

4x = 16

x = 4

Required area = 16 cm²

S12. Ans.(e)
Sol. Area = $\frac{1}{2} \times base \times height$

Let the base and height be 7x and 13x respectively

ATQ,

$\frac{1}{2} \times 7x \times 13x = 182$

x² = 4

x = 2

Required height = 13 × 2 = 26 cm

S13. Ans.(a)

Sol. Information given:

The ratio of length to breadth of a rectangle is 4 : 3

Area of the rectangle is 300 cm square

The breadth of rectangle decreased by 20% and the length is increased by 10%,

Formula Used:

Area of the rectangle = Length × breadth

Perimeter of the rectangle = 2 (Length + breadth)

Explanation:

Let length and breadth of the rectangle is 4x cm & 3x cm respectively

$12x^2 = 300$

$x^2 = 25$

$x = 5$

Length of the rectangle = 5 × 4 = 20 cm

Breadth of the rectangle = 5 × 3 = 15 cm

After breadth decreased by 20%, new breadth of the rectangle = 15×4/5 = 12 cm

After length increased by 10%, new length of the rectangle = 20 ×11/10 = 22 cm

Required perimeter = 2 × (22+12) = 68 cm

S14. Ans.(e)

Sol. Area of the square = $(l + 4)^2 = (l^2 + 16 + 8l)$ cm²

ATQ,

$(l^2 + 16 + 8l) = 2\left(\frac{1}{2} \times (l + 1) \times (l + 8)\right)$

$l^2 + 16 + 8l = l^2 + 9l + 8$

$8 = l$

The base of the triangle = l+1

= 8 + 1 = 9 cm

S15. Ans.(a)

Sol. Let each of base and height of the isosceles right-angle triangle is a meter

so its hypotenuse will be $a\sqrt{2}$ m.

Area of isosceles right-angle triangle = 128 × 16

$\frac{1}{2} \times a \times a$ = 2048 m²

a^2 = 4096.

a=64 m.

so, its hypotenuse = $64\sqrt{2}$ m.

Now, radius of the Sphere = $\frac{1}{8} \times 64\sqrt{2}$

= $8\sqrt{2}$ m.

Total surface area of the sphere = $4\pi \times 8\sqrt{2} \times 8\sqrt{2}$

=512π m²

S16. Ans.(b)
Sol. Volume of cylinder = πr²h (r-radius , h – height)

Volume of sphere = $\frac{4}{3}$πr³

ATQ

$\frac{\pi r^2 h}{\frac{4}{3}\pi r^3} = \frac{3}{1}$

$\Rightarrow \frac{h}{r} = \frac{4}{1} \Rightarrow$ h = 4r

T.S.A of cylinder = 2πr (r+h)

T.S.A of sphere = 4πr²

Required Ratio = $\frac{2\pi r\ (r+h)}{4\pi r^2} = \frac{4r+r}{2r} = \frac{5}{2}$

S17. Ans.(d)
Sol. Area of equilateral triangle = $\frac{\sqrt{3}}{4}$a² = 49$\sqrt{3}$

$\Rightarrow$ a = 14 cm = radius of cone(r)

Slant height of cone = 50 cm

Then, height of cone = $\sqrt{50^2 - 14^2}$ = 48 cm

∴ Volume of cone = $\frac{1}{3}\pi r^2 h$

= $\frac{1}{3} \times \frac{22}{7} \times 14 \times 14 \times 48$

= 9856 cm³

S18. Ans.(e)
Sol. ATQ,

Let side of an equilateral triangle be 'a' cm.

$\frac{\sqrt{3}}{2}\ a = 3\sqrt{3}$

a = 6 cm

Area of equilateral triangle = $\frac{\sqrt{3}}{4}$ (6)² = $\frac{\sqrt{3}}{4}$ × 36 = 9$\sqrt{3}$ cm²

Radius of circle inscribed in an equilateral triangle = $3\sqrt{3} \times \frac{1}{3} = \sqrt{3}$ cm

Area of inscribed circle = $\pi(\sqrt{3})^2 = 3\pi$ cm²

Required ratio = $\frac{9\sqrt{3}}{3\pi} = \frac{21\sqrt{3}}{22}$