Tender Heart High School, Sec. 33B, Chd.

Subject : Mathematics Date : 10.2.2025
Class : IX Teacher : Ms. Reena

Topic : Revision of Simultaneous Linear Equations

Ques1: Solve the following pair of linear equations :-

(i) $\frac{3x}{2} - \frac{5y}{3} = -2$

$\frac{x}{3} + \frac{y}{2} = \frac{13}{6}$ [Ans. $x = 2, y = 3$]

(ii) $4x + \frac{6}{y} = 15$

$6x - \frac{8}{y} = 14$ [Ans. $x = 3, y = 2$]

(iii) $83x - 67y = 383$

$67x - 83y = 367$ [Ans. $x = 3, y = -2$]

(iv) $\frac{3x-7}{2} - \frac{2y-8}{3} = -1$

$\frac{5-x}{3} - \frac{3-2y}{7} = 1$ [Ans. $x = -1, y = -2$]

(v) $\frac{20}{x+y} + \frac{3}{x-y} = 7$

$\frac{8}{x-y} - \frac{15}{x+y} = 5$ [Ans. $x = 3, y = 2$]

Ques 2: A man buys postage stamps of denominations 25 paise for ₹10. He buys 28 stamps in all. Find the number of 25 paise stamps bought by him.

[Ans. 16]

Ques 3: The sum of a two digit number and the number obtained by interchanging the digits is 132. If the two digits differ by 2, find the numbers.

[Ans. 75, 57]

Ques 4: 3 men and 4 boys can do a piece of work in 14 days, while 4 men and 6 boys can do it in 10 days. How long would it take 1 boy to finish the work?

[Ans. 140 days]

Ques 5: Find the fraction which becomes $\frac{1}{2}$ when the denominator is increased by 4 and is equal to $\frac{1}{8}$ when the numerator is diminished by 5.

[Ans. $\frac{6}{8}$]

Ques 6: A boat takes 2 hours to go 40 km down the stream and it returns in 4 hours. Find the speed of the boat in still water and the speed of the stream.

[15 km/hr, 5 km/hr]

Topic : Perimeter and Area of Plane Figures

Ques:1 Sides of a triangle are in the ratio 12:17:25 and its perimeter is 540 cm. Find its area.

[Ans. 9000 cm^2]

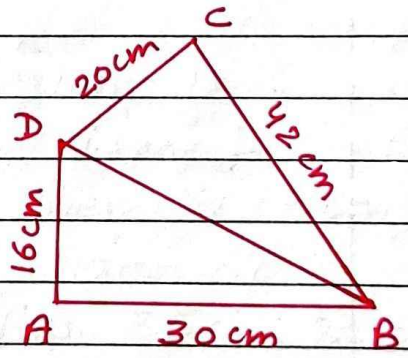
Ques:2 The perimeter of a right-angled triangle is 60cm. If its hypotenuse is 26cm, find the area of the triangle.

[Ans. 120 cm^2]

Ques:3 In ΔABC, $\angle B = 90°$, $AB = (2x+1)$ cm and $BC = (x+1)$ cm. If the area of the ΔABC is 60 cm^2, find its perimeter.

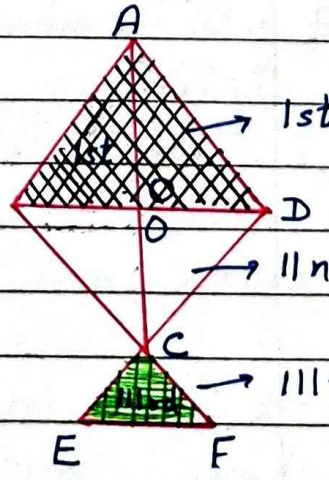
[Ans 40 cm]

Ques:4 Calculate the area of a quadrilateral ABCD in which $\angle A = 90°$, AB = 30cm, BC = 42cm, CD = 20cm and DA = 16 cm

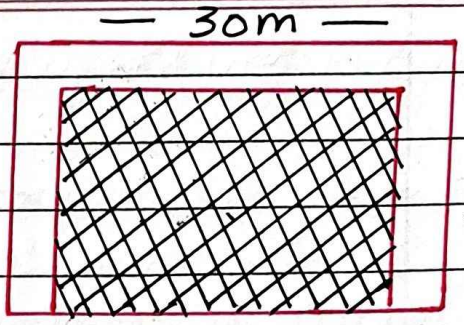


[Ans. 576 cm^2]

Ques 5 A kite in the shape of a square with diagonal 32cm and an isosceles triangle of base 8cm and sides 6cm each is to be made of three different shades as shown in the figure. How much paper of each shade has been used in it.



Ques 6: The shaded region of the given diagram represents the lawn in front of a house. On three sides of the lawn there are flower-beds of width 2m.



(i) Find the length and the breadth of the lawn.

(ii) Find the area of the flower-beds.

[Ans. 26m, 10m, 100m²]

Ques 7: A rectangle has twice the area of a square. The length of the rectangle is 12cm greater and the width is 8cm greater than a side of a square. Find the perimeter of the square. [Ans. 96cm]

Ques 8: The area of a trapezium is 540 cm². If the ratio of parallel sides is 7:5 and the distance between them is 18cm, find the length of parallel sides.

[Ans. 35cm, 25cm]

Ques 9: If the sides of a rhombus are 5cm each and one diagonal is 8cm, calculate

(i) the length of the other diagonal

(ii) the area of the rhombus.

[Ans 6cm, 24cm²]

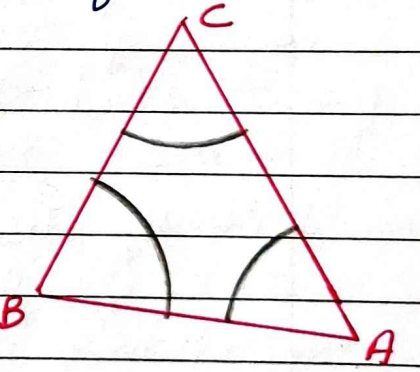
Ques 10: A rectangular room is 6m long, 4.8m wide and 3.5m high. Find the inner surface area of the four walls. [Ans. 75.6m²]

Topic: Circumference and Area of a Circle

Ques 1: Two circles touch externally. The sum of their areas is 58π cm^2 and the distance between their centres is 10cm. Find the radii of the two circles.

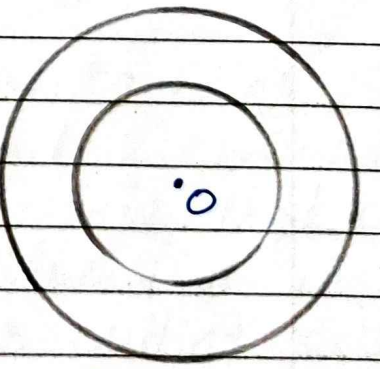
[Ans. 7cm, 3cm]

Ques 2: Sides of a triangular field are 15m, 16m, 17m. With the three corners of the field a cow, a buffalo and a horse are tied separately with ropes of length 7m each to graze in the field. Find the area of the field which cannot be grazed by the three animals.



[Ans. $(24\sqrt{21} - 77)$ m^2]

Ques 3: In the given figure, the area enclosed between the concentric circles is 770 cm^2. Given that the radius of the outer circle is 21cm, calculate the radius of the inner circle.

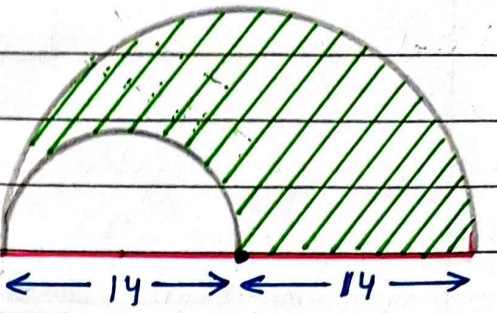


[Ans. 14cm]

Ques 4: The sum of diameters of two circles is 14cm and the difference of their circumferences is 8cm. Find the circumference of the two circles.

[Ans 26, 18]

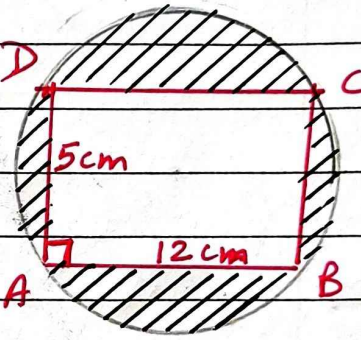
Ques 5: Find the area and perimeter of the shaded region in given figure.



The diamensions are in centimetres

[Ans. 231 cm^2, 80 cm]

Ques 6: In the given figure, calculate the area of the shaded region correct to two decimal places.
(Take $\pi = 3.142$)



Given, AB = 12cm, AD = 5cm

[Ans. 72.75 cm^2]

Ques 7: A circular field has perimeter 660 m. A plot in the shape of a square having its vertices on the circumference is marked in the field. Calculate the area of the square field.

[Ans: 22050 m^2]

Ques 8: A student takes a rectangular piece of paper 30 cm long and 21 cm wide. Find the area of the biggest circle that can be cut out from the paper. Also find the area of the paper left after cutting out the circle.

[Ans. 346.5 cm^2
283.5 cm^2]

Topic: Volume and Surface Area of Solids

Ques 1: The square on the diagonal of a cube has an area of 192 cm^2. Calculate
(i) the sides of the cube in cm
(ii) the total surface area of the cube in cm^2

[Ans 8cm, 384cm^2]

Ques 2: The length of a hall is 24m and its width is 16m. If the lateral surface area of the hall is two-third of the sum of the areas of the roof and the floor, find its height.

[Ans. 6.4m]

Ques 3: The length of a room is 50% more than its breadth. The cost of carpeting the room at the rate of ₹38.50 m^2 is ₹924 and the cost of papering the walls at ₹3.30 m^2 is ₹214.50. If the room has one door of dimensions 1m x 2m and two windows each of dimensions 1m x 1.5m, find the dimensions of the room.

[Ans. $l = 6m, b = 4m, h = 3.5m$]

Ques 4: A hollow square shaped tube open at both ends, is made of iron. The internal square is of 5cm side and the length of the tube is 8cm. There are 192 cm^3 of iron in this tube. Find its thickness.

[Ans. 1cm]

Ques 5: Three cubes whose edges are x cm, 8 cm and 10 cm respectively are melted and recast into a single cube of edge 12 cm. Find x.

[Ans. $x = 6$]

Ques 6: The volume of a cuboidal block of silver is 10368 cm^3. If its dimensions are in the ratio 3:2:1, find

(i) the dimensions of the block

(ii) the cost of gold polishing its entire surface at ₹ 0.50 per cm^2 [Ans. 12cm, ₹ 1584]

Ques 7: The area of cross-section of a pipe is 3.5 cm^2 and water is flowing out of pipe at the rate of 40 cm/s. How much water is delivered by the pipe in one minute?

[Ans. 8.4 litres]

Ques 8: A field is 30m long and 18m broad. A pit 6m long, 4m wide and 3m deep is dug out from the middle of the field and the earth removed is evenly spread over the remaining area of the field. Find the rise in the level of the remaining part of the field in centimetres correct to two decimal places.

[13.95]

Topic : Trigonometrical Ratios

Ques 1: Given $\sec\theta = \frac{13}{12}$, calculate all other trigonometrical ratios.

Ques 2: If $\cot B = \frac{12}{5}$, find $\sin^4 B \sec^2 B$

Ques 3: If $\sin\theta = \frac{\sqrt{3}}{2}$ and $\cos\phi = \frac{1}{\sqrt{2}}$, find the value of $\frac{\tan\theta - \tan\phi}{1 + \tan\theta \tan\phi}$

Ques 4: If $5\tan\theta = 4$, find the value of

$$\frac{5\sin\theta - 3\cos\theta}{5\sin\theta + 2\cos\theta}$$

Ques 5: Given A is an acute angle and $\operatorname{cosec} A = \sqrt{2}$, find the value of

$$\frac{2\sin^2 A + 3\cot^2 A}{\tan^2 A - \cos^2 A}$$

Ques 6: If $5\cos\theta - 12\sin\theta = 0$, find the value of $\frac{\sin\theta + \cos\theta}{2\cos\theta - \sin\theta}$

Ques 7: The diagonals AC and BD of a rhombus ABCD meet at O. If AC = 8cm and BD = 6cm, find $\sin \angle OCD$

Ques 8: Find the value of

$$\sin^2 30^\circ \cos^2 45^\circ + 4\tan^2 30^\circ + \frac{1}{2}\sin^2 90^\circ - 2\cos 90^\circ$$

[Ans. $\frac{47}{24}$]

Ques 9: Evaluate $\dfrac{3\sin 3A + 2\cos(5A + 10^\circ)}{\sqrt{3}\tan 3A - \operatorname{cosec}(5A + 20^\circ)}$

when $A = 10^\circ$

[Ans. $\frac{-5}{2}$]

Ques 10: If $x = 15^\circ$, find the value of

$4\sin 2x \cos 4x \sin 6x$

[Ans. 1]

Ques 11: If $\tan 3x = \sin 45^\circ \cos 45^\circ + \sin 30^\circ$

find the value of x [Ans 15°]

Ques 12: Find the values of the following :-

(i) $\tan 48^\circ \tan 23^\circ \tan 42^\circ \tan 67^\circ$ [Ans. 1]

(ii) $\dfrac{\cot 35^\circ}{\tan 55^\circ} - \dfrac{1}{2}\left(\dfrac{\sec 25^\circ}{\operatorname{cosec} 65^\circ}\right) + 3\sin 31^\circ \sec 59^\circ$

[Ans. $7\frac{1}{2}$]

(iii) $\sin 25^\circ \cos 65^\circ + \cos 25^\circ \sin 65^\circ$ [Ans. 1]

(iv) $5\sin 50^\circ \sec 40^\circ - 3\cos 59^\circ \operatorname{cosec} 31^\circ$

[Ans. 2]

(v) $\dfrac{\sin 35^\circ \cos 55^\circ + \cos 35^\circ \sin 55^\circ}{\operatorname{cosec}^2 10^\circ - \tan^2 80^\circ}$ [Ans. 1]