BHARATIYA VIDYA BHAVAN'S V.M.PUBLIC SCHOOL, VADODARA
SESSION 2017-18
SAMPLE PAPER – 9

Class : X Max Marks:80
Subject : MATHEMATICS Time Allotted: 3 hrs

Instructions:

1. All questions are compulsory.
2. The question paper consists of 30 questions. Section – A comprises of 6 questions of 1 mark each, Section – B comprises of 6 questions of 2 marks each, Section – C comprises of 10 questions of 3 marks each and Section – D comprises of 8 questions of 4 marks each.
3. Use of calculator is not permitted.

SECTION - A

1. Express 10626 as product of prime factors.
2. Which term of the A.P. 92, 88, 84, 80, ... is 0 ?
3. Find the probability that a non leap year chosen at random has
   (i) 52 Sundays (ii) 53 Sundays
4. Find the diameter of a circle whose area is equal to the sum of the areas of the two circles of radii 40 cm and 9 cm .
5. Find the length of the tangent drawn from a point 8 cm away from the centre of a circle, of radius 6 cm .
6. In the given figure find the ratio in which P divides AB internally .:

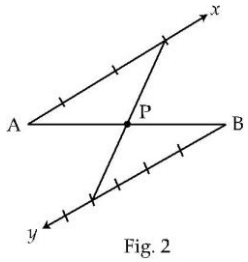


Fig. 2

SECTION - B

7. Prove $2\sqrt{3}/5$ is irrational .
8. If α,β are the zeroes of $x^2 - 2x - 15$,then form a quadratic polynomial whose zeroes are 2α, 2β .
9. Find the solution of $2x + 4y = 10$ and $3x + 6y = 12$ by substitution method.
10. Prove that the line segment joining the points of contact of two parallel tangents to a circle is a diameter of the circle.
11. Find the point on *x*-axis which is equidistant from the points (22, 5) and (2, 23).
12. The radius and slant height of a right circular cone are in the ratio of 7 : 13 and its curved surface area is 286 cm^2. Find its radius.

SECTION - C

13. 111 cows ,185 sheep and 296 goats are to be taken across a river.There is only one boat and the boatman says he will take the same number and the same kind of animals in each trip. Find the largest number of animals in each trip and the number of trips he will make.
14. The sum of squares of two consecutive odd numbers is 394 .Find the numbers.
15. How many terms of the A.P. 9, 17, 25, ... , must be taken to get a sum of 450 ?
16. In Figure, in triangle ABC, D and E are the mid-points of the sides BC and AC respectively. Find the length of DE. Prove that DE= 2 AB.

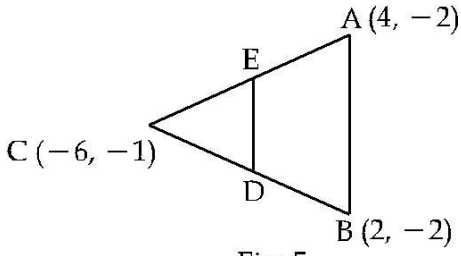


Fig. 5

17. In Figure, XY and X' Y' are two parallel tangents to a circle with centre O and another tangent AB, with point of contact C intersects XY at A and X' Y' at B. Prove that ∠ AOB = 90^0 .

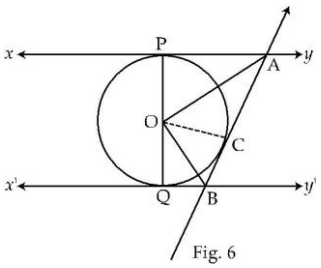


Fig. 6

18. Prove that $(\sin A + \text{cosec } A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$.
19. A tree is broken by the wind. The top struck the ground at an angle of 30^0 and at a distance of 30 metres from its root. Find the whole height of the tree. (Use $\sqrt{3} = 1.732$).
20. All the face cards of spades are removed from a pack of 52 playing cards and then the pack is shuffled well. A card is then drawn at random from the remaining pack of cards. Find the probability of getting (i) a black face card, (ii) a queen.
21. In Figure arcs are drawn by taking vertices A, B and C of an equilateral triangle of side 10 cm, to intersect the sides BC, CA and AB at their respective mid-points D, E and F. Find the area of the shaded region (Use pi =3.14)

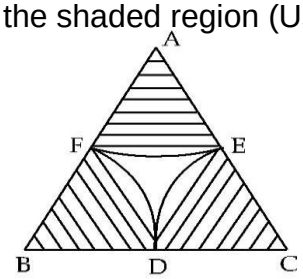


Fig. 3

22. A cylindrical pipe has inner diameter of 4 cm and water flows through it at the rate of 20 m per minute. How long would it take to fill a conical tank, with diameter of base as 80 cm and depth 72 cm ?

Section D

23. A boat goes 30 m upstream and 44 km downstream in 10 hrs. In 13 hrs it can go 40 km upstream and 55 km downstream. Find the speed of the stream and of the boat in still water.
24. The diagonal of a rectangular field is 60 m more than the shorter side .Find the sides of the field.
25. Find the height of a mountain if the elevation of its top at an unknown distance from the base is $60^0$and at a distance 10 km further off from the mountain, along the same line, the angle of elevation is 30^0 .

26. Draw a right triangle with sides of length 5 cm and 4 cm making a right angle. Construct another triangle whose sides are $3/5$ times the corresponding sides of the first triangle.

27. Marks obtained by 400 students in an examination is as follows:

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No. of students	10	20	22	40	55	75	80	58	28	12

Draw more than and Less thanOgives and therefrom find the median marks.What value do you attach to the performance of the students?

28. Show that the points (24, 0), (4, 0) and (0, 3) are vertices of an isosceles triangle.
29. A tower stands vertically on the ground. From a point on the ground which is 60 m away from the foot of the tower, the angle of elevation of the top of the tower is found to be 60^0. Find the height of the tower.
30. Show that the point P (24, 2) lies on the line segment joining the points A (24, 6) and B (24, 26).

S.Devasena

1 10 1 1 10

! ! ! "

1. $x^2$12 kx1450 2 k

(A) 21 (B) 22 (C) 2 (D) 24

2. A.P. 92, 88, 84, 80, ... 0

(A) 23 (B) 32 (C) 22 (D) 24

3. ! " # $ %

(A) 308 (B) 608 (C) 458 (D) 158

4. 608 6 m

(A) $6\sqrt{3}$ m (B) $3\sqrt{m}$ (C) $2\sqrt{3}$ m (D) $3\sqrt{2}$ m

5. 40 cm 9 cm !" # $ % # $!" & '

(A) 41 cm (B) 49 cm (C) 82 cm (D) 62 cm

6.15 cm (& ' 16 cm !") * + !, # $

(A) 60 p cm^2 (B) 68 p cm^2 (C) 120 p cm^2 (D) 136 p cm^2

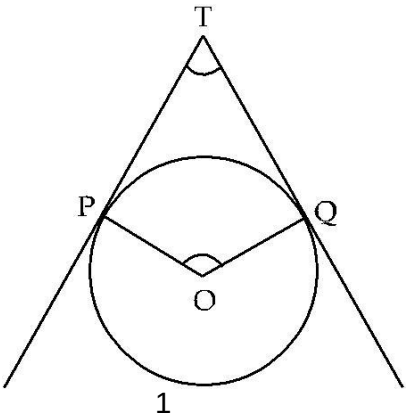
7. 6 cm 8 cm ! " !

! #$ %

(A) $\sqrt{7}$ cm (B) $2\sqrt{7}$ cm (C) 10 cm (D) 5 cm

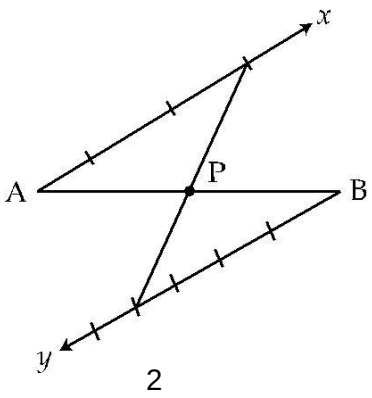
8. & 1 ' (# TO ! " !)TP& $TQ

#$ ∠POQ 5 1108 #$(∠ PTQ #$ %



(A) 608 (B) 708 (C) 808 (D) 908

9. 2 P AB



2

(A) 3 : 4 (B) 4 : 3 (C) 3 : 7 (D) 4 : 7

10. 458

! ! " #

(A) 708 (B) 1458 (C) 1358 (D) 1058

11 182

11. k4 $x^2$22 (k11) *x*1(k11)50

12. A.P.8 $\frac{1}{2}$! $\frac{17}{6}$ " # $ %

& "

13. ' % ( ) * &+, " ' * 60m % ' -

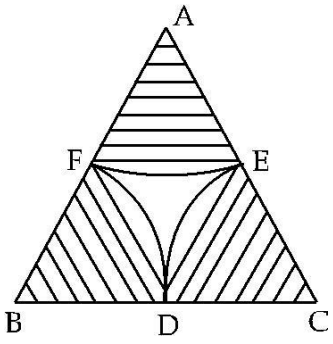
.

/ 0' 1 608

14. 3 10 cm ! ABC " # A,$ B C %&' ( )

* BC, CA AB ' " + D, E F * *' ,- & - . / ! / ! 0

(p53.14)



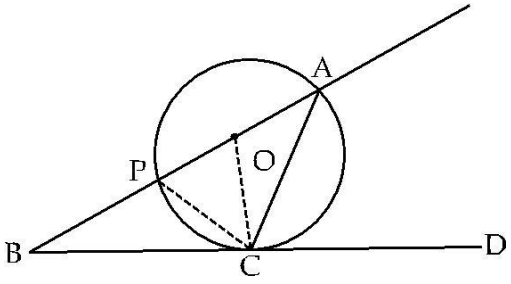
3

15.

! !"#

4 O BCD C ! "#

∠ BAC 1∠ ACD 5 908



4

16. P (24, 2) A (24, 6) B (24, 26)

17. *x*- (22, 5) (2, 23)

18. !" # 7:13$ % & $ ' & ( ) *

286 cm^2 (p5 $\frac{22}{7}$)

19 28 3

19. $a^2b^2x^2 1b^2x 2a^2x 2150$

x : $6x^2 17x 21050$

20. 450 A.P. 9, 17, 25, ... ,

21. 5 cm ! 4 cm " # " $

% & $\frac{3}{5}$ $

22. " # ' 4cm ! (# 20m) "
!$ * ' 80 cm ! #+ 72 cm , -) .
#

36 cm ! " # 3 cm $% & ! 6cm ' ( ) (*)
+ ') , ')'
(' - '.

23. ! ' / ' * 0 12 3 4 &)) , * 5 ' 6 4) ' , 7 4

(i) 52 (ii) 53

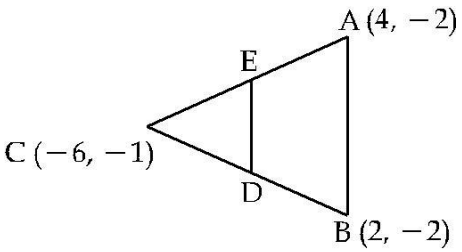
24. 52 - ' 8' ' 9 : * : ; 12 ' 9 * !) - 4 : ; : 0 12 3) *)<) ' / ' *

(i) 9 : (ii) (

8 6 4
! " # $

(i) (ii)

25. 5 D E ! % $ & '(ABC '(BC AC) * + (DE + # 1
" , DE5 2 AB

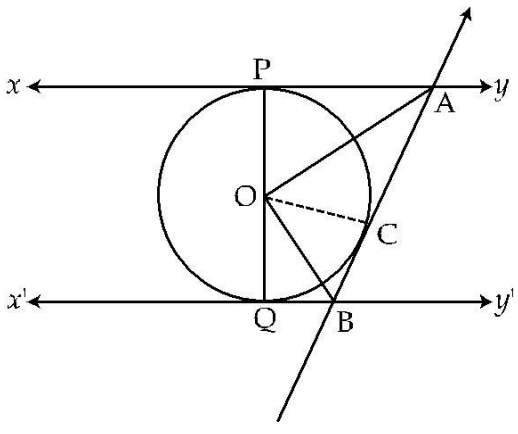


5

26. (24, 0), (4, 0) (0, 3)

, , ! " #$ % & ' #$" %

27. 6 XY X Y O , , AB
C XY A X Y B
∠ AOB 5 908



6

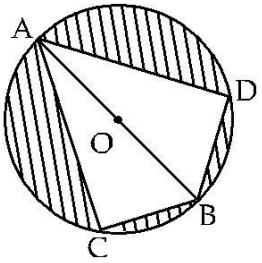
An urn contains 8 red, 6 white, 4 black balls. A ball is drawn at random from the urn. Find the probability that the drawn ball is.

(i) red or white (ii) neither black nor white

OR

A hemispherical bowl of internal diameter 36 cm. is full of liquid. This liquid is to be filled in cylindrical bottles of radius 3 cm and height 6 cm. How many such bottles are required to empty the bowl ?

28. 7 BC5BD58 cm , AC5AD515 cm
O (p53.14)



7

29 34 4

29. 16 !
" # "$% " &!

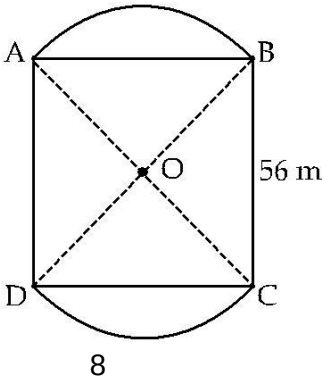
30. ' $% 2009 (& ")* + $% , "- . 20 0"1 /"" 2 ! " 3
12300 , "- " ")* + $% & (' 1$% 2009 " 3 " ")* + $%
4 , "- . 5 " &!

31. " $% " T 6 / O 07 $% 8 9 $ %4 & TP TQ$% 4 ! " 1 " & "
∠ PTQ 5 2∠ OPQ !

32. & : 3$% ;%$% < 2 & 07 3 < $% 9 $% !
: =:" < 2 13.5 ;%$% ! " # $% "> ? 14 ;%$% (2 : "$% 0@
2 A B /" ;%$% $% ;% $% , "$% " " &!

! "
19 cm #$ % 7cm # #$ & ' ( ) * + #

33. # 8 , 56 m - . - & */ 0 ! 1
&23 0 4 2 . 5 6 &2 #78 o # .
*/ 0 ( ) * + #



8

34. 30 308
(3 51.732 √)

608
10 km 308

- o O o -