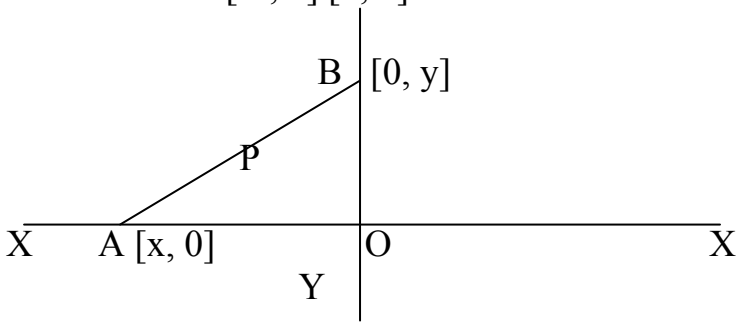
MATHS SAMPLE PAPER
CLASS - X
SECTION A 3 MARKS EACH

1. If A [5, 3], B [- 1, 1] and C [7, - 3] are the vertices of the triangle. If D and E are the mid points of AB & AC then prove that DE = BC/2.
2. In the figure below, if P[- 4, 2] and AP : PB = 1 : 2 find the coordinates of A & B? [-6, 0] [0, 6]



3. two dice Are thrown find the probability of
   a) An even number as sum. [1/2, 1/6, 1/6, 5/6]
   b) A total of at least 10.
   c) A sum greater than 9
   d) Neither 9 nor 11 as sum.
4. Two concentric spheres have the radii r and 2r. A cone is inscribed in the bigger circle such that it circumscribes the smaller sphere. Show that the volume of the cone is $3pir^3$ and its curved area is $6pir^2$
5. Solve for a and b

$$2^a + 3^b = 17$$
$$2^{a+2} - 3^{b+1} = 5$$

[3, 2]

6. if $\frac{5x - 11}{2x^2 + x - 6} = \frac{A}{x + 2} + \frac{B}{2x - 3}$ find A and B [3, -1]
7. simplify

$$\frac{2x + y}{x + y} - 1 \sim 1 - \frac{y}{x + y}$$ [1]

8. find x:

$$\frac{x^4}{x^2 + 3x + 2} + 2[x^2 + 3x + 2] = 12\frac{1}{6}x^2$$ [1, -2/5]

9. A group of persons decided to buy a clock between 170/- to 195/-. At last moment two persons backed out and remaining had to pay 1/- more each. What was the price of the clock?
[180/-]

10. simplify

$$\frac{x - x^{-2}}{x^{1/2} - x^{-1/2}} - \frac{1 - x^{-2}}{x^{1/2} + x^{-1/2}} - x^{1/2} \qquad [2/y.y^{1/2}]$$

SECTION B 4 MARKS EACH

11. In a right triangle prove that the sum of the lengths of the legs is equal to the sum of the diameters of the inscribed and the circumscribed circle.
12. if the first term of the AP is a, second term is b and the last term is c then show that sum is equal to

$$\frac{[a + c]\,[b + c - 2a]}{2[b - a]}$$

13. the first term is a and the last term is l, if S is the sum then show that

$$d = \frac{l^2 - a^2}{2S - [l + a]}$$

14. The height of the cylinder is 10.5 m. three times the sum of the areas of its two circular areas is twice the area of the curved surface. Find the volume of the cylinder? [1617 cm^3]
15. A TV set is for 13500/- cash or 4500/- cash down followed by 4 monthly installments of 2400/- each. Find the rate %? [$33^{1/3}$ %]
16. A person finds that of he increases the weekly wages of the workers by 50/- and employs one worker less, he reduces his weekly expenses from 6800/- to 6570/-. Find the weekly wages of each worker? [680/-]
17. A cyclist riding for a certain distance stops for half an hour. And completes the journey of 30 km at half the speed in 5 hours. If the breakdown had occurred 10 km further he would have done the journey in 4 hours. Find where the break down had occurred and the

original speed? [10 km/hr and 15 km from starting point]

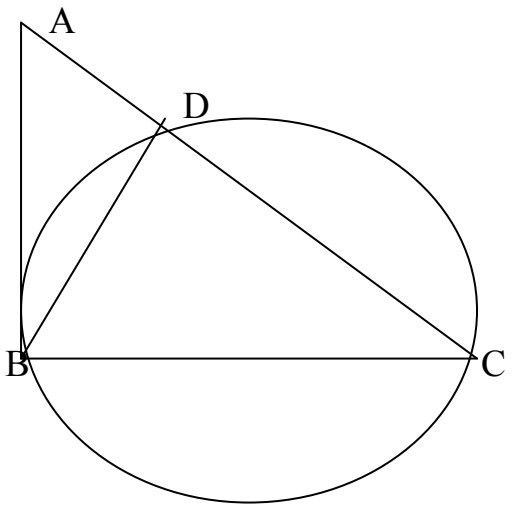
18. If 5sin + 3cos = 4, then find the value of 3sin – 5cos?
19. if the mean is 6 years find the value of p [8]

ages	people
0 – 2	1
2 – 4	2
4 – 6	p
6 – 8	5
8 – 10	3
10 – 12	1

SECTION C 6 MARKS EACH

20. in the figure below, BD is perpendicular top AC, < ABC = 90^o, prove that

$AC \times AD = AB^2$
$AC \times CD = BC^2$



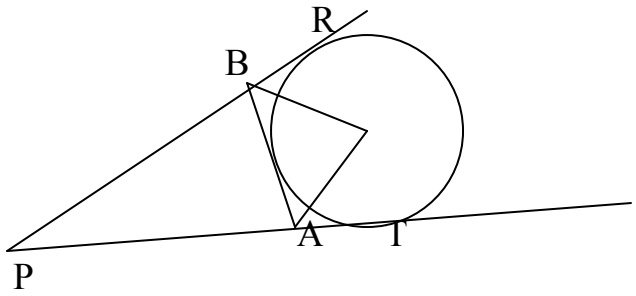
21. from a point on the ground the angle of elevation of the bird flying at the constant speed in horizontal direction are A, B, C, and D. prove that

$\cot^2 A - \cot^2 D = 3[\cot^2 B - \cot^2 C]$

22. If cosec – sin = L and sec – cos = m then prove that

$$L^2m^2[L^2 + m^2 + 3] = 1$$

23. In the figure below, < P = 40, find < AOB. [70^o]



24. Find a and b so that the polynomials:
    $p(x) = (x^2 + 3x + 2)(x^2 + 2x + a)$ and
    $q(x)$ - $(x^2 + lx+\2)(x^2 + 7x + b)$
    may have $(x + 1)(x + 3)$ as their HCF.

25. Solve for x : $a^2b^2x^{2+}b^2x - a^2x - 1 = 0$