# Sample Paper – 2015
# Class – XII
# Subject – MATHEMATICS

**Time Alloted:3hrs** **Max. Marks: 100**

## SECTION--A

1. Let * be the binary operation defined on N defined by a*b = H.C.F. of a and b. Find the identity element if it exists.
2. Using principal values, find $\cot^{-1}\left(\tan\frac{2\pi}{3}\right)$.
3. If the matrix $\begin{pmatrix} 1 & a & 2 \\ 1 & 2 & 5 \\ 2 & 1 & 1 \end{pmatrix}$.is non-invertible , find the value of a.
4. If A = $\begin{pmatrix} \cos x & \sin x \\ -\sin x & \cos x \end{pmatrix}$ and A. AdjA = kI , where I is the unit matrix of order 2,find the value of k.
5. If A= $\begin{pmatrix} 2x & 1 & 2 \\ 2m+x & 0 & -3 \\ -2 & 3 & 0 \end{pmatrix}$ is skew symmetric , find *m*.
6. Evaluate: i· (kxj) + j· (kxi) + k· (ixj)
7. Find the unit vector perpendicular to the vectors $\vec{a} = \hat{i} - \hat{j} + \hat{k}$, and $\hat{b} = \hat{i} - \hat{j} - \hat{k}$
8. Find the angle between the lines $\frac{x-2}{3} = \frac{y+1}{-2}, z = 2$ and $x - 1 = \frac{y+3}{3} = \frac{z+5}{2}$
9. Evaluate: $\int_0^1 xe^{x^2}dx$.
10. Determine the value of k if $f(x) = \begin{cases} \frac{|Sinx|}{x} & x \neq 0 \\ k & x = 0 \end{cases}$ is continuous at x= 0.

## SECTION--B

11. Let f: X$\rightarrow$Y be a function. Define a relation R on X given by R = { (a , b) : f(a) = f(b) }.Show that R is an equivalence relation on X.
12. If $\cos^{-1}\left(\frac{x}{a}\right) + \cos^{-1}\left(\frac{y}{b}\right) = \alpha$ , *prove that* $\frac{x^2}{a^2} - \frac{2xy}{ab}\cos\alpha + \frac{y^2}{b^2} = \sin^2\alpha$ OR

*Solve for* $x$: $\tan^{-1}(x+1) + \tan^{-1}(x-1) + \tan^{-1}x = \tan^{-1}3x$

13. *If* $x \neq y \neq z$ *and* $\begin{vmatrix} x & x^2 & 1+x^3 \\ y & y^2 & 1+y^3 \\ x & z^2 & 1+z^3 \end{vmatrix} = 0$, *then prove that* $xyz + 1 = 0$.
14. If x = 3sint –sin3t, y = 3cost-cos3t, find $\frac{d^2y}{dx^2}$. **<u>OR</u>** If $y = \cos^{-1}\left[\frac{2x - 3\sqrt{1-x^2}}{\sqrt{13}}\right]$, find $\frac{dy}{dx}$.

15. If $y = x\log\left(\frac{x}{a+bx}\right)$, then prove that $\frac{d^2y}{dx^2} = \frac{1}{x}\left(\frac{a}{a+bx}\right)^2$ .

16. Find the intervals in which the function f(x) = $-x^4+4x^3-4x^2-15$, is (a) Increasing (b) Decreasing**OR**

Find the equation of the tangent to the curve x = θ + sinθ, y = 1 + cosθ at θ= π /4.

17. Evaluate $\int \frac{(x-3)e^x}{(x-1)^3}dx$ **OR** $\int \frac{1}{\sin x - \sin 2x}dx$

18. Find the probability distribution of number of doublets in three throws of a pair ofdice.

19. Find the equation of the plane passing through the point (-1, -1, 2) and perpendicular to the planes x + 2y – 3z = 1 and 5x – 4y + 3z = 5.

20. If vectors $\vec{a}, \vec{b} and \vec{c}$ ,are such that each is perpendicular to sum of other two and if $|\vec{a}| = 6, |\vec{b}| = 8 and |\vec{c}| = 10$, find $|\vec{a}+\vec{b}+\vec{c}|$.

21. Solve the differential equations $(\tan^{-1} y - x)dy = (1+y^2)dx$

22. Solve the differential equation: $xdy - ydx = \sqrt{x^2+y^2}\ dx$

## SECTION--C

23. Evaluate $\int_1^3 (2x^2+3+e^{-2x})dx$ as limit of sums. OR Evaluate: $\int_0^{\pi/2}\left(\sqrt{\tan x}+\sqrt{\cot x}\right)dx$

24. A card from the pack of 52 cards is lost. From the remaining cards of the pack, two cards are drawn and are found to be both diamonds. Find the probability of lost card being diamond.

25. If A = $\begin{bmatrix} 0 & 1 & 3 \\ 1 & 2 & 1 \\ 2 & 3 & 1 \end{bmatrix}$ find $A^{-1}$. Hencesolve the system of equations: y +2z +8=0, x+2y +3z+14 = 0, 3x + y + z+8 =0

26. A given quantity of metal is to be cast into a solid half circular cylinder with rectangular base and semicircular ends. Show that in order that the surface area may be minimum, the ratio of the length of the cylinder to the diameter of its circular ends is π: π + 2.

**OR**

A cylindrical container with a capacity of 20 cubic feet is to be produced. The top and bottom of the container are to be made of a material that costs Rs.6 per square foot while the side of the container is made of material costing Rs.3 per squares foot. Find the dimension that will minimize the total cost.

27. Find the area of the region $\{(x, y) : 0 \le y \le x^2 + 1; 0 \le y \le x + 1, 0 \le x \le 2\}$

28. Find the image of the point (1,3,4) in the plane 2x-y+z + 3= 0

29. A dietician has to develop a special diet using two food P and Q. Each packet (containing 30 g) of food P contains 12 units of calcium, 4 units of iron, 6 units of cholesterol and 6 units of vitamin A. Each packet of same quantity of food Q Contains 3 units of calcium, 20 units of iron, 4 units of cholesterol and 3 units of vitamin A. The diet requires at least 240 units of calcium, at least 460 units of iron and at most 300 units of cholesterol. How many packets of each food should be used to minimize the amount of vitamin A in the diet? What is the minimum amountof vitamin A.

# MATHEMATICS
# REVISION-2

**TIME: 3 Hrs.** **Max. Marks:100**

## SECTION--A

1. Find the principal value of $\cos^{-1}\left(\frac{\cos 13\pi}{6}\right)$.

2. Let A = $\{1,2,3\}$ B = $\{4,5\}$ C = $\{5,6\}$. Let f:A→ B, g:B→ C be defined by f(1)=4, f(2)=5, f(3)=4, g(4)=5, g(5)=6. Find gof : A→ C.

3. A is a non-singular matrix of order 3 and $|A|$ = -4. Find $|adjA|$.

4. If A = diag[2,-5,9], B = diag[-3, 7, 14] and C = diag[4,-6,3] find 2A + B - 5C.

5. Evaluate $\int\sqrt{1+\sin x}\,dx$ .

6. Find the slope of the tangent to the curve y = $(\sin 2x + \cot x + 2)^2$ at x = $\frac{\pi}{2}$.

7. If $\begin{vmatrix} 2 & x \\ -1 & 3 \end{vmatrix} = \begin{vmatrix} 4 & 0 \\ 1 & 1 \end{vmatrix}$, find $x$ .

8. Find $|\vec{a}-\vec{b}|$ if vectors $\vec{a}$ and $\vec{b}$ are such that $|\vec{a}|$ = 2, $|\vec{b}|$ = 3 and $\vec{a}\cdot\vec{b}$ = 4.

9. Find the area of the parallelogram whose diagonals are along the vectors $2\hat{i}$ and $3\hat{k}$.

10. Find the intercepts cuts by the plane 3x-2y+4z-12 = 0 on axes.

## SECTION--B

11. Prove that $\tan^{-1}\frac{3}{4} + \tan^{-1}\frac{3}{5} - \tan^{-1}\frac{8}{19} = \frac{\pi}{4}$ **OR** Solve $\sin^{-1}(1-x) - 2\sin^{-1}x = \frac{\pi}{2}$

12. Using properties of determinants prove that

$$\begin{vmatrix} -bc & b^2+bc & c^2+bc \\ a^2+ac & -ac & c^2+ac \\ a^2+ab & b^2+ab & -ab \end{vmatrix} = (ab+bc+ca)^3$$

13. Let f:Z→ Z:f(n)=3n and Let g:Z→ Z defined by

$$g(n) = \begin{cases} \frac{n}{3} & \text{if } n \text{ is a multiple of } 3 \\ 0 & \text{if } n \text{ is not a multiple of } 3 \end{cases}$$

Show that gof = Iz and fog ≠ Iz.

14. Find the equation of the normal lines to the curve y = $4x^3-3x+5$which are parallel to line9y+x+3 = 0.

15. Find the derivative of $5^{\log\sin x}+(\sin x)^x$ with respect to x **OR**

Verify Rolle's theorem for the function f(x) = sinx + cosx, $x \in [0, \pi/2]$

16. Find all the points of discontinuity of f(x) defined by f(x)= $|x|-|x+1|$

17. Evaluate $\int 5^{5^{5^x}} . 5^{5^x} . 5^x \, dx$ **OR** Evaluate $\int \frac{1}{\sin(x-p)\cos(x-q)} dx$.

18. Find the value of p so that the lines $\frac{1-x}{3} = \frac{7y-14}{2p} = \frac{z-3}{2}$ and $\frac{7-7x}{3p} = \frac{y-5}{1} = \frac{6-z}{5}$ are at right angles.

19. If $\hat{a}$ and $\hat{b}$ are two unit vectors and θ is the angle between them, then show that $\sin\frac{\theta}{2} = \frac{1}{2}|\hat{a} - \hat{b}|$

20. Form the differential equation representing the family of ellipses having foci on x axis and centre at origin.

21. Solve the differential equation $\frac{dy}{dx} = x^5\tan^{-1}(x^3)$.**OR** Solve the differential equation $(1+e^{x/y})dx + e^{x/y}(1-\frac{x}{y})dy = 0$.

22. An antiaircraft gun can take a maximum of three shots at an enemy plane moving away from it.The probability of hitting the plane at first, second and thid shot are $\frac{2}{3}, \frac{2}{5}$, and $\frac{3}{8}$ respectively. What is the probability that plane is hit?

## SECTION--C

23. Find the matrix A such that $\begin{bmatrix} 3 & 2 \\ 7 & 5 \end{bmatrix} A \begin{bmatrix} -1 & 1 \\ -2 & 1 \end{bmatrix} = \begin{bmatrix} 2 & -1 \\ 0 & 4 \end{bmatrix}$ **OR**

Using the elementary transformation, find the inverse of the matrix $\begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix}$.

24. Evaluate the integral $\int_{-1}^{2} [\,|x+1| + |x| + |x-1|\,] \, dx$.

25. Calculate the area of the region enclosed between the circles $x^2+y^2 = 1$ and $(x - \frac{1}{2})^2 + y^2 = 1$ **OR** Find the area of the region $\{(x, y) : x^2 + y^2 \le 2ax,\ y^2 \ge ax,\ x \ge 0,\ y \ge 0\}$

26. Find the distance of the point (2,2,-1) from the plane x+2y-z = 1 measured parallel to the line $\frac{x+1}{2} = \frac{y+1}{2} = \frac{z}{3}$.

27. Two cards are drawn simultaneously from a well-shuffled pack of52 cards. Find the mean, variance and standard deviation of the number of kings.

28. A medical company has factories at two places A and B. From these places, supply is made to each of its three agencies at P,Q an R. The monthly requirement of the agencies are respectively 40, 40 and 50 packets of the medicines, while the production capacity of factories A and B are 60 and 70 packets respectively. The transportation cost per packet from the factories to the agencies are given below.

| Transportation cost per packet | | |
|---|---|---|
| To from | A | B |
| P | 5 | 4 |

| | | |
|---|---|---|
| Q | 4 | 2 |
| R | 3 | 5 |

How many packets from each factory be transported to each agency so that the cost of the transportation
is minimum? Also find the minimum cost?

29. Prove that, the radius of the right circular cylinder of greatest curved surface which can be inscribed in a
given cone, is half of that of the cone.

**MATHEMATICS** **REVISION-3**
**TIME: 3 Hrs.** **Max. Marks:100**

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**SECTION A**

1. Let f(x) = [x] and g(x) = |x|. Find (gof)$\left(-5/3\right)$- (fog)$\left(-5/3\right)$.
2. 2. Evaluate $\sin^{-1}\left(\frac{1}{2}\right) + 2\cos^{-1}\left(\frac{-\sqrt{3}}{2}\right)$.
3. Construct a 2×2 matrix A = [aij] where aij = $\frac{(3i-j)^2}{2}$
4. Given an example of two matrices A and B such that A ≠ 0, B≠0,AB = 0 and BA ≠ 0.
5. Evaluate $\int \tan^4 x \; dx$.
6. Find the point on the curve $y^2 = 8x$ for which abscissa and ordinate changes at the same rate.
7. A is a square matrix of order 3 such that | A | = 8. Find | 3A |
8. Find the projection of the vector $\hat{i} + 3\hat{j} + 7\hat{k}$ on the vector $7\hat{i} + \hat{j} + 8\hat{k}$.
9. If $|\vec{a} + \vec{b}| = |\vec{a} - \vec{b}|$, then find the angle between the $\vec{a}$ and $\vec{b}$.
10. Find the distance of the plane x+y+3z+7 = 0 from the origin.

**SECTION B**

11. Consider $f: R^+ \to [-5, \infty]$ given by $f(x) = 9x^2+6x-5$. Show that ‘f’ is invertible, also find $f^{-1}$.
12. Solve $\tan^{-1}\frac{x-1}{x-2} + \tan^{-1}\frac{x+1}{x+2} = \frac{\pi}{4}$ **OR**

Prove that $\tan^{-1}\left[\frac{\sqrt{1+x^2} + \sqrt{1-x^2}}{\sqrt{1+x^2} - \sqrt{1-x^2}}\right] = \frac{\pi}{4} + \frac{1}{2}\cos^{-1}x^2$.

13. Find the value of a and b so that the function f(x) is defined by

$$f(x)=\begin{cases} x^2 + ax + b, & 0 \le x < 2 \\ 3x + 2, & 2 \le x \le 4 \\ 2ax + b, & 4 < x \le 8 \end{cases}$$ becomes continuous on [0, 8].

14. Solve the equation $\begin{vmatrix} x & -6 & -1 \\ 2 & -3x & x-3 \\ -3 & 2x & x+2 \end{vmatrix}=0$

15. Find the intervals in which the function f(x) = $\sin^4 x + \cos^4 x$ in $\left[0, \frac{\pi}{2}\right]$ is (a) increasing (b) decreasing**OR**

16. If $y = \log\left\{x + \sqrt{x^2 + a^2}\right\}$ prove that $(x^2 + a^2)\frac{d^2y}{dx^2} + x\frac{dy}{dx} = 0$.

17. If $x = a(\theta + \sin\theta)$ and $y = a(1 - \cos\theta)$ find $\frac{d^2y}{dx^2}$ at $\theta = \frac{\pi}{2}$.

18. Evaluate $\int \frac{1}{\sin x - \sin 2x} dx$ **OR** Evaluate $\int \frac{2\sin 2\theta - \cos\theta}{6 - \cos^2\theta - 4\sin\theta} d\theta$

19. If $\vec{\alpha} = 3\hat{i} - \hat{j}$ and $\vec{\beta} = 2\hat{i} + \hat{j} - 3\hat{k}$. Express $\vec{\beta}$ as a sum of two vectors $\overrightarrow{\beta_1}$ and $\overrightarrow{\beta_2}$, where $\overrightarrow{\beta_1}$ is parallel to $\vec{\alpha}$ and $\overrightarrow{\beta_2}$ is perpendicular to $\vec{\alpha}$.

20. Find the shortest distance between two line whose vector equations are $\vec{r} = (\gamma-1)\hat{i} + (\gamma+1)\hat{j} - (\gamma+1)\hat{k}$

$\vec{r} = (1-\mu)\hat{i} + (2\mu-1)\hat{j} + (\mu+2)\hat{k}$

21. The surface area of a balloon being inflated changes at a constant rate. If initially its radius is 3 units and after 3 seconds, it is units. Find the radius of the balloon after 't' seconds.

22. Solve the differential equation $(\sin^{-1}y - x)dy = \sqrt{(1 - y^2)}\,dx$, y(0) = 0. **OR**

Solve the differential equation $x\frac{dy}{dx} = y(\log y - \log x + 1)$.

23. The odds that a book will be received favourably by three independentcritics are 5:2, 4:3 and 3:4 respectively. What is the probability that majority will be in favour of the book.

**SECTION C**

23. Determine the product $\begin{bmatrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & -1 \end{bmatrix}\begin{bmatrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 3 \end{bmatrix}$ and use it to solve the system of equation x-y+z = 4, x-2y-2z = 9, 2x+y+3z = 1. **OR**

Using elementary transformation find the inverse of the following matrix $\begin{bmatrix} 2 & -1 & 4 \\ 4 & 0 & 2 \\ 3 & -2 & 7 \end{bmatrix}$

24. Using properties of definite integrals evaluate $\int_0^{\frac{\pi}{2}} \frac{x\sin x\cos x}{\sin^4 x + \cos^4 x} dx$

25. Find the area of the circle $4x^2+4y^2 = 9$ which is interior to the parabola $y^2 = 4x$.**OR**
Find the area of the region $\{(x, y) : x^2 \leq y \leq |x|\}$

26. Find the distance of the point (-2, 3, -4) from the line $\frac{x+2}{3} = \frac{2y+3}{4} = \frac{3z+4}{5}$ measured parallel to the plane 4x+12y-3z+1 = 0.

27. Find the sides of a rectangle of greatest area that can be inscribed in the ellipse $x^2+4y^2 = 16$.

28. In 2005, there will be three candidates for the position of principal $C_1$, $C_2$ and $C_3$. The chances of their selection are in the proportion 4:2:3 respectively. The probability that $C_1$, if selected, will

introduce co-education in the college is 0.3. The probability of $C_2$ and $C_3$ doing the same are respectively 0.5 and 0.8. What is the probability that there will be co-education in the college in 2005. Also find the probability if given that co-education was introduced in the college, it was done so by principal $C_2$.

29. A furniture dealer deals in only two items, tables and chairs. He has Rs.5000 to invest and a space to store at most 60 pieces. A table costs him Rs.250/- and a chair Rs.50/-. He can sell a table at a
profit of Rs.50/- and chair at a profit Rs.15/-. Assuming that he can sell all the items that he buys, how should he invest his money in order that he may maximize his profit. Solve it graphically.



**MATHEMATICS** **REVISION-4**

**TIME: 3 Hrs.** **Max. Marks:100**

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**SECTION A**

1. Let $f:R\rightarrow R: f(x) = 2x+1$ and $g:R\rightarrow R: g(x) = x^2-2$, find gof .

2. Given $A = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}$ such that $|A| = -10$. Find $a_{11}c_{11} + a_{12}c_{12}$.

3. If $\sin^{-1}x - \cos^{-1}x = \frac{\pi}{6}$ , then find the value of x.

4. Solve for x and y given that $\begin{bmatrix} x & y \\ 3y & x \end{bmatrix}\begin{bmatrix} 1 \\ 2 \end{bmatrix} = \begin{bmatrix} 3 \\ 5 \end{bmatrix}$

5. Evaluate $\int e^x \frac{(1+x\log x)}{x}$ dx

6. Find the equation of the normal to the curve $y = 2\sin^2 3x$ at $x = \frac{\pi}{6}$

7. If $A = \begin{bmatrix} \sin x & -\cos x \\ \cos x & \sin x \end{bmatrix}$, find x if A + A' = I.

8. Find the value of $\gamma$ for which the plane $\vec{r}.(\hat{i} + 2\hat{j} + 3\hat{k}) = 13$ and $\vec{r}.(\gamma\hat{i} + 2\hat{j} - 7\hat{k}) = 9$ are perpendicular to each other.

9. If $|\vec{a}| = 2$, $|\vec{b}| = 5$ and $|\vec{a} \times \vec{b}| = 8$. Find $\vec{a}.\vec{b}$

10. Find a unit vector parallel to the sum of vector $\vec{a} = 2\hat{i} + 4\hat{j} - 5\hat{k}$ and $\vec{b} = \hat{i} + 2\hat{j} - 3\hat{k}$

**SECTION B**

11. Using properties of determinants prove that

$$\begin{vmatrix} a & b & ax+by \\ b & c & bx+cy \\ ax+by & bx+cy & 0 \end{vmatrix} = (b^2-ac)(ax^2+2bxy+cy^2)$$

12. Prove that $\cot^{-1}\left[\frac{\sqrt{1+\sin x}+\sqrt{1-\sin x}}{\sqrt{1+\sin x}-\sqrt{1-\sin x}}\right] = \frac{x}{2}$ x $\in \left(0, \frac{\pi}{4}\right)$ **.OR**

Prove that $\tan\left[\frac{\pi}{4}+\frac{1}{2}\cos^{-1}\frac{a}{b}\right] + \tan\left[\frac{\pi}{4}-\frac{1}{2}\cos^{-1}\frac{a}{b}\right] = \frac{2b}{a}$

13. Show that the relation R: N$\rightarrow$ N defined by (a, b)R(c, d)$\Leftrightarrow$ a+d = b+cfor all (a,b),(c,d)$\in$ N$\times$ N is an equivalence relation.

14. For what value of k, is the functionf(x)= $\begin{cases} \frac{1-\cos 4x}{8x^2}, & x \neq 0 \\ k, & x = 0 \end{cases}$ is continuous at x = 0

15. If $x = \sin\left(\frac{1}{a}\log y\right)$, show that $(1-x^2)y_2 - xy_1 - a^2y = 0$.

16. Using differentials, find the approximate value of f(5.001), where $f(x)= x^3-7x^2+ 15$**OR**

Use differentials to find the approximate value of $\sqrt{0.037}$

17. Evaluate $\int \frac{x^2}{(x^2+1)(x^2+4)}$ dx **OR** Evaluate $\int \frac{dx}{\sin^4 x + \cos^4 x}$ dx

18. Find a unit vector perpendicular to each of the vector $2\hat{i} - \hat{j} + \hat{k}$ and $3\hat{i} + 4\hat{j} - \hat{k}$.

19. Prove that equation of the plane making intercepts a,b and c on theco-ordinate axes is of the form $\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 1$.

20. Solve the differential equation $\frac{dy}{dx} - 3y\cot x = \sin 2x$, given that y = 2 when $x = \frac{\pi}{2}$.

21. Solve the differential equation of all circles in first quadrant which touch the co-ordinate axes x and y.

**OR**

Solve the differential equation $x\frac{dy}{dx}$ -y = xtan $\frac{y}{x}$ given that y = $\frac{\pi}{2}$ when x=1

22. A die is thrown 10 times.If getting an even number is a success,Find the probability of getting atleast 9 successes.

**SECTION C**

23. If A = $\begin{bmatrix} 1 & -1 & 1 \\ 2 & 1 & -3 \\ 1 & 1 & 1 \end{bmatrix}$, find $A^{-1}$ and use it to solve the system of equations x+2y+z = 4, -x+y+z = 0, x-3y+z = 2

**OR**

Use elementary transformation, find the inverse of the following matrix $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 5 & 7 \\ -2 & -4 & -5 \end{bmatrix}$

24. Evaluate the integral using limit of sum $\int_{1}^{3}(2x^2 + x + 9)$ dx

25. Find the area of the region using integration

$\{ (x,y): 0 \le y \le x^2 + 3, \quad 0 \le y \le 2x + 3, \quad 0 \le x \le 3 \}$ **OR**

Compute using integration, the area of the region bounded by the lines y = 4x+5, y = 5-x, 4y-x = 5

26. Find the image of the point (2, 3, 7) in the plane 3x-y-z = 7.

27. A card from a pack of 52 cards is lost. From the remaining cards of the pack, two cards are drawn and are found to be both spades. Find the probability of the lost card being a spade.

28. A manufacturer makes two products A and B. Product A sells at Rs.200/- per unit and takes 30 minutes to make. Product B sells at Rs.300/- per unit and takes 1 hour to make. There is a permanent order of 14 units of product A and 16 unit of product B. A working week consists of 40 hours of production and the weekly turnover must not be less than Rs.10000/-. If the profit on each unit of product A is Rs.20/- and on product B is Rs.30/-, then find how many unit of each product should be produced to get maximum profit. Also find the maximum profit. Solve the problem graphically.

29. A wire of length 20m is to be cut into two pieces. One of the pieceswill be bent into the shape of square and the other into shape of an equilateral triangle. Where the wire should be cut so that the sum of their areas is maximum?