

Dear Parents,



Session 2018-2019 is progressing quite well. We just had our 'Orientation Session' with Primary, Middle and Secondary schoolers parents and it was heartening to see your approach, co-operation and support. APS family extends gratitude for it.

A warm welcome to students who have joined our school this session. We stand committed to providing quality education to our children. The teachers follow a detailed plan of instruction that is guided by CBSE and AWES. SAMC is our pillar of strength as our teachers focus on holistic development of our students. We shall certainly continue to implement our 'Systems Approach' to support all students by using interventions to help each child make academic progress. Progress is best assured when student, parents and school are working towards same goal. It's like when every player is an active member, the team is sure to be the best and everyone is a winner. So let's strive to be all winners!

For Summer Break Assignments, practice sheets are devised to ensure revisions for coming assessment. Kindly go to the website: www.apsbinnaguri.org and follow these steps for the same

Steps to download:

- i. Browse the website→ Home page (first page of the website)
- ii. Then check the Bulletin Board→ link will be available.

OR

Home Page→ Click on 'APS News' option→ Choose Holiday Homework option from the dropdown menu.

We would also seek your co-operation to help lift up academics. We would welcome parents to offer their names for substitute facilitators/ teachers, judges for events round the year. Kindly e-mail at apsbinnaguri1@gmail.com or give your details at Front Desk.

We truly believe that an entire community is needed to empower our students to become successful citizens. I look forward to a great year and working with such an amazing community.

Awaiting your constructive suggestions.



ARMY PUBLIC SCHOOL BINNAGURI
MATHEMATICS PRACTICE SHEET , SESSION 2018-19
CLASS: X

REAL NUMBERS

1 MARK types:

1. Write whether $\frac{2\sqrt{45}+3\sqrt{20}}{2\sqrt{5}}$ on simplification gives a rational or an irrational number.
2. Find the HCF of 960 and 432.
3. Write whether the rational number $\frac{51}{1500}$ will have a terminating decimal expansion or a non-terminating repeating decimal expansion.
4. Write a rational number between $\sqrt{2}$ and $\sqrt{3}$.
5. Find the HCF and LCM of 96 and 404 using Fundamental Theorem of Arithmetic method (Prime Factorisation)

2 MARKS types:

1. A rational number in its decimal expansion is 327.7081. What can you say about the prime factors of q, when this number is expressed in the form $\frac{p}{q}$? Give reasons.
2. If HCF (6, a) = 2 and LCM (6, a) = 60 then find a.
3. If remainder of $\frac{(5m+1)(5m+3)(5m+4)}{5}$ is a natural number then find it.
4. Can two numbers have 18 as their HCF and 380 as their LCM? Give reasons.

3 MARKS types:

1. Use Euclid's Division Algorithm to show that the cube of any positive integer is of the form $9m$, $9m + 1$ or $9m + 8$
2. Without actually performing the long division, find if $\frac{987}{10500}$ will have terminating or non-terminating (repeating) decimal expansion. Give reason for your answer.
3. Find the HCF of 52 and 117 and express it in form $52x + 117y$.
4. Prove that $x^2 - x$ is divisible by 2 for all positive integer x.
5. If the HCF of 408 and 1032 is expressible in the form $1032p - 408 \times 5$, find p.
6. Show that $5 + 3\sqrt{2}$ is an irrational number.
7. Show that any positive odd integer is of the form $4q + 1$ or $4q + 3$, where q is some integer.

4 MARKS types:

1. Prove that one and only one out of n, n+2 and n+4 is divisible by 3, where n is any positive integer.
2. Prove that one of any three consecutive positive integers must be divisible by 3.
3. If m and n are odd positive integers, then $m^2 + n^2$ is even, but not divisible by n. Justify.
4. Floor of a room is to be fitted with square marble tiles of the largest possible size. The size of the room is 10 m x 7 m. What should be the size of tiles required are to be cut and how many such tiles are required?
5. Prove that $\sqrt{3}$ is irrational.

POLYNOMIALS

1 MARK types:

1. If α, β are zeroes of the polynomial $2y^2 + 7y + 5$, write the value of $\alpha + \beta + \alpha\beta$.
2. If one zero of the polynomial $x^2 - 4x + 1$ is $2 + \sqrt{3}$. Write the other zero.
3. For what value of k , (-4) is a zero of the polynomial $x^2 - x - (2k + 2)$?
4. If α and β are zeroes of the polynomial $x^2 - px + q$, then find the value of $\alpha^2 + \beta^2$?
5. If α and β are zeroes of the polynomial $x^2 - p(x+1) - c$ such that $(\alpha+1)(\beta+1) = 0$

2 MARKS types:

1. Find the quadratic polynomial sum of whose zeroes is 8 and their product is 12. Hence find the zeroes of polynomial.
2. Using division algorithm, find the quotient and remainder on dividing $f(x)$ by $g(x)$ where $f(x) = 6x^3 + 13x^2 + x - 2$ and $g(x) = 2x + 1$
3. α, β are zeroes of the polynomial $x^2 - 6x + a$. Find the value of a if $3\alpha + 2\beta = 20$.
4. α, β are zeroes of the quadratic polynomial $x^2 - (k + 6)x + 2(2k - 1)$. Find the value of $\alpha + \beta = \frac{1}{2}\alpha\beta$.
5. Form a quadratic polynomial whose zeroes are $\frac{3-\sqrt{3}}{5}$ and $\frac{3+\sqrt{3}}{5}$.

3 MARKS types:

1. Find a quadratic polynomial whose zeroes are 1 and -3. Verify the relation between the coefficients and zeroes of polynomial.
2. Find the zeroes of quadratic polynomial $4x^2 - 4x - 3$ and verify the relation between the zeroes and coefficients.
3. If the polynomial $6x^4 + 8x^3 + 17x^2 + 21x + 7$ is divided by another polynomial $3x^2 + 4x + 1$, the remainder comes out to be $(ax + b)$, find a and b .
4. If $x + a$ is a factor of the polynomial $x^2 + px + q$ and $x^2 + mx + n$ prove that $a = \frac{n-q}{m-p}$.
5. Write cubic polynomial whose zeroes are $2 - 2\sqrt{5}, 2 + 2\sqrt{5}, 1$.
6. α, β, γ are zeroes of cubic polynomial $kx^3 - 5x + 9$. If $\alpha^3 + \beta^3 + \gamma^3 = 27$, find the value of k .

4 MARKS types:

1. Find k so that $x^2 + 2x + k$ is a factor of $2x^4 + x^3 - 14x^2 + 5x + 6$. Also find all zeroes of the two polynomials.
2. If the zeroes of polynomial $x^3 - ax^2 + bx - c$ are in AP then show that $2a^2 - 9ab + 27c = 0$
3. Given that the zeroes of the cubic polynomial $x^3 - 6x^2 + 3x + 10$ are of the form $a, a + b, a + 2b$ for some real numbers a and b , find the values of a and b as well as the zeroes of the given polynomial.
4. Find k so that $x^2 + 2x + k$ is a factor of $2x^2 + x^3 - 14x^2 + 5x + 6$. Also find all the zeroes of the two polynomials.
5. Obtain all the zeroes of $3x^4 + 6x^3 - 2x^2 - 10x + 5$, if two of its zeroes are $\sqrt{\frac{5}{3}}$ and $-\sqrt{\frac{5}{3}}$.
6. Obtain all the zeroes of $x^4 + 7x^3 - 17x^2 - 17x + 6$, if two of its zeroes are 3 and 1.

LINEAR EQUATIONS

2 MARKS types:

1. Find the value of k for which the given system has unique solution:
 $2x + 3y - 5 = 0$; $kx - 6y - 8 = 0$.
2. Find the value of k for which the following system of equation has no solution: $kx - 5y = 2$; $6x + 2y = 7$.
3. Solve for x and y :
 $631x + 279y = 910$
 $279x + 631y = 910$
4. Find the value of m for which pair of linear equations $2x + 3y - 7 = 0$ and $(m-1)x + (m+1)y = (3m - 1)$ has infinitely many solutions.
5. For what value of k will the system of linear equations have infinite number of solutions:
 $kx + 4y = k - 4$, $16x + ky = k$?
6. Without drawing the graph, find out whether the lines representing the following pair of linear equations intersect at a point, are parallel or coincident.
 $18x - 7y = 24$; $\frac{9}{5}x - \frac{7}{10}y = \frac{9}{10}$

3 MARKS types:

1. Solve for x and y : $\frac{xy}{x+y} = \frac{6}{5}$; $\frac{xy}{y-x} = 6$, where $x + y \neq 0$; $y - x \neq 0$.
2. Solve for x and y : $bx + ay = a + b$.
(i) $ax\left(\frac{1}{a-b} - \frac{1}{a+b}\right) + by\left(\frac{1}{b-a} - \frac{1}{b+a}\right) = \frac{2a}{a+b}$
3. Solve for x and y :
 $\frac{2}{3x+2y} + \frac{3}{3x-2y} = \frac{17}{5}$
 $\frac{5}{3x+2y} + \frac{1}{3x-2y} = 2$
4. In a den (a small enclosure) there are rabbits and peasants (game birds). They have between them 35 heads and 98 feet. How many rabbits are there?
5. The monthly incomes of A and B are in the ratio of 9:7 and their monthly expenditures are in the ratio 4:3. If each saves Rs. 1600 per month, find the monthly income of each.
6. Solve the following system of equations graphically: $2x - y = 4$; $x - 2y = -4$
7. Solve the following system of linear equations
(a) $a(x+y) + b(x-y) = a^2 - ab + b^2$
 $a(x+y) - b(x-y) = a^2 + ab + b^2$
8. Solve for x and y : $\frac{x+1}{2} + \frac{y-1}{3} = 8$; $\frac{x-1}{3} + \frac{y+1}{2} = 9$
9. Solve for x , y and z : $x + y + z = 9$, $2y - z = 2$, $z - x = 2$.

4 MARKS types:

1. Solve the following system of equations by cross multiplication method:
 $\frac{x}{a} + \frac{y}{b} = a + b$; $\frac{x}{a^2} + \frac{y}{b^2} = 2$
2. Seven times a two digit number is equal to four times the number obtained by reversing the order of digits and sum of the digits is 3. Find the number.
3. In a cyclic quadrilateral ABCD,
 $\angle A = (2x + 4)^\circ$ $\angle B = (y + 3)^\circ$ $\angle C = (2y + 10)^\circ$ $\angle D = (4x - 5)^\circ$
Find all the four angles.

4. Point A and B are 70 kms apart on a highway. A car starts from A and another car starts from B at the same time. If they travel in the same direction, they meet in 7 hours, but if they travel towards each other they meet in one hour. What are their respective speeds?
5. A is 2 years older than B. A's father D is twice as old as A and B is twice as old as his sister C. The ages of D and C differ by 40 years. Find the ages of A and B.
6. 10 students of class X took part in a Mathematics quiz. If the number of girls is 4 more than the number of boys, find the number of boys and girls who took part in quiz. Form the pair of linear equations of the above problem and find its solution graphically.
7. 8 men and 12 boys can finish a piece of work in 10 days while 6 men and 8 boys can finish it in 14 days. Find the time taken by one man alone and that by one boy alone to finish the work.
8. A man travels 370 km partly by train and partly by car. If he covers 250 km by train and the rest by car it takes him 4 hours. But if he travels 130 km by train and the rest by car, he takes 18 minutes longer. Find the speed of the train and that of the car.
9. Determine graphically the coordinates of the vertices of a triangle, the equations of whose sides are $y = x$; $3y = x$; $x + y = 8$.
10. Solve for x and y; $ax + by = a - b$, $bx - ay = a + b$.
