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.

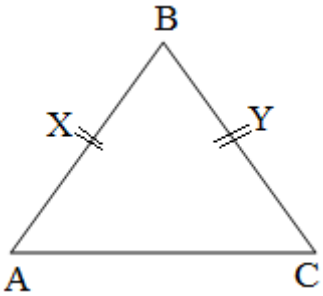
Awaiting your constructive suggestions.

ARMY PUBLIC SCHOOL BINNAGURI
PRACTICE SHEET - 1
MATHEMATICS
CLASS – IX

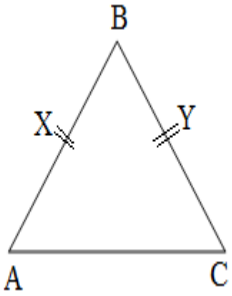
EUCLID'S GEOMETRY:

SECTION-A

1. it is known that x+y=10 and that x=z . Show that x+z=10?
2. In the given figure, we have AB=BC, BX =BY. Show that AC= XY.



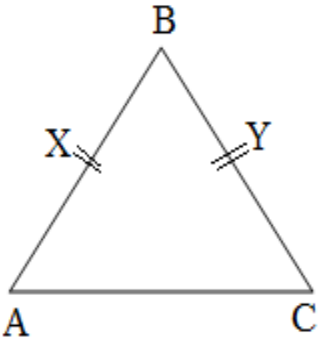
3. We have x and Y are the mid points AC and BC and AX=CY . Show that AX=CY.



4. In the given figure, we have

BX= $\frac{1}{2}$ AB

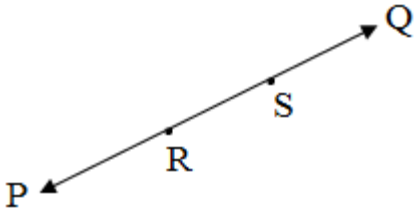
BY=$\frac{1}{2}$ BC and prove that AB= AC



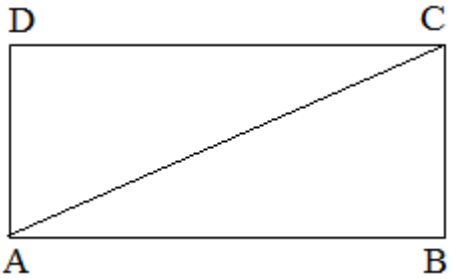
5. Two salesman makes equal sales during the month of august. In September, each salesman doubles his sale of the month of august. Compare their sales in September.

SECTION-B

6. Solve the equation a-15=25 and state which axiom do you use here.
7. State fifth postulate of Euclid.
8. In the given figure, if PS = RQ, Then prove that R =SQ.



9. In the given figure, if BAC=BCA And DAC = DCA . By which Euclid's axiom, it can be shown that if ∠DCA=∠BCA , Then ∠BAC=∠DAC.



10. Prove that every line segment has one and only one mid point.

11. Does Euclid's fifth postulate imply the existence of parallel lines?

SECTION-C

12. Read the following statement:

An equilateral triangle is a polygon made up of three line segments out of which two line segments are equal to third one and all its angles are 60 °each.

Define the terms used in this definition which you feel necessary. Are there any undefined terms in this? Can you justify that all sides and all angles are equal in a equilateral triangle.

13. Study the following statement:

"Two intersecting lines cannot be perpendicular to the same line".

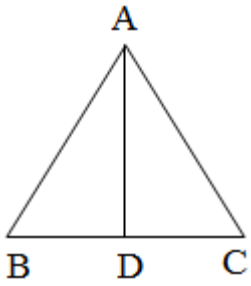
Check whether it is an equivalent version to the Euclid's fifth postulate.

14. Read the following statements which are taken as axioms:

(i) if a transversal intersects two parallel lines , then corresponding angles are not necessarily equal.

(ii) if a transversal intersects two parallel lines , then alternate interior angles are equal.

15. In the adjoining figure, AC > AB and AD and AD is the bisector of BAC, show that ADC >ADB.



16. Read the following axioms:

(i) Things which are equal to the same thing are equal to one another.

(ii) If equals are added to equals , the wholes are equal.

(iii) Things which are double of the same thing are equal to one another.

Check whether the given system of axioms is consistent or inconsistent.

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ARMY PUBLIC SCHOOL BINNAGURI
PRACTICE SHEET - 2
MATHEMATICS
CLASS – IX

LINES AND ANGLES:

SECTION – A

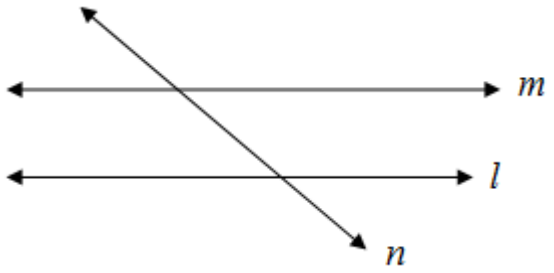
1. Angles of a triangle are in the ratio 2:4:3 what is the measure of smallest angle.

2. Can a triangle have two obtuse angles? Give reason for your answer.

3. Two adjacent angles are equal. Is it necessary that each of these angles will be a right angle? Justify your answer.

4. Two lines l and m are perpendicular to the same line n. are l and m perpendicular to each other? Give reason for your answer.

5. Find the value of x for which lines l and m are parallel



SECTION- B

6. The angles of a triangle are in the ratio 2:3:4. Find the angles of the triangle.

7. A triangle ABC is a right angled at A. L is a point on BC such that AL is perpendicular to BC, prove that ∠BAL = ∠ACB.

8. Two lines are respectively perpendicular to two parallel lines. Show that they are parallel to each other.

9. In the below figure, OD is bisector of ∠AOC, OE is the bisector of ∠BOC and OD is perpendicular to OE, show that points A, O and B are collinear.

SECTION –C

10. If two lines intersect, prove that vertically opposite angles are equal.

11. Bisectors of interior angle ∠B and exterior angle ∠ACD of a ΔABC intersect at point T. Prove that $\angle BTC=\frac{1}{2}\angle BAC$.

12. A transversal intersects two parallel lines. Prove that the bisectors of any pair of corresponding angles so formed are parallel.

13. Prove that two lines that are respectively perpendicular to two intersecting lines intersect each other.

14. Prove that through a given point, we can draw only one perpendicular to two intersecting lines intersects each other.

15. Prove that a triangle must have at least two acute angles.

16. In a triangle ABC, If 2A =3 B=6C determine$\angle$A.

SECTION-D

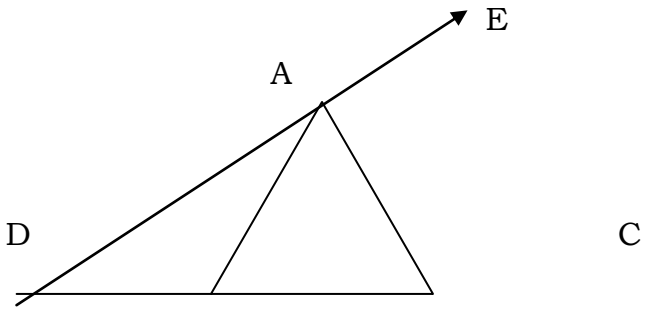
17. Lines AB, CD, and EF intersect each other at o. find the measures of $\angle$AOC, $\angle$COF, $\angle$DOE and $\angle$BOF.

18. Two parallel lines are cut by a transversal, prove that

(i) Bisectors of alternate angles are parallel to each other.

(ii) Bisectors of corresponding angles are parallel to each other.

19. If AB divides $\angle$DAC in ratio = 1:3, determine $\angle$ACB.



20. In ΔABC if BO and CO is respectively bisectors of$\angle$ABC and $\angle$ACB. Then prove that

$$\angle BOC=90^\circ+\frac{1}{2}\angle A$$

21. If two parallel lines are intersected by a transversal, prove that the bisectors of two pairs of interior angles enclose a rectangle.

ARMY PUBLIC SCHOOL BINNAGURI
PRACTICE SHEET - 3
MATHEMATICS
CLASS – IX

NUMBER SYSTEMS

SECTION –A

1. Find the value of $_{32}2 / 5$.

2. If we add two irrational numbers, the resulting number

(a) Is always an irrational number (b) is always a rational number

(c) May be a rational or an irrational number (d) always an integer

3. Arrange the following in descending order of magnitude: $\sqrt[8]{90}$, $\sqrt[4]{10}$.

4. Let x and y be rational and irrational numbers, respectively. Is x+y necessarily irrational number? Give an example support of your answer.

5. State whether the following statements are true or false? Justify your answer

a) $\frac{\sqrt{2}}{3}$ Is a rational number.

b) There are infinitely many integers between any two integers.

c) Number of rational numbers between 15 and 18 is finite.

d) The square of an irrational number is always rational.

e) $\frac{\sqrt{12}}{\sqrt{3}}$ Is not a rational numbers as √12 and √3 are not integers.

6. Find which of the variables x, y, z and u represent rational numbers and which irrational numbers:

i) x^2=5 ii) y^2 =9 iii) z^2=.04 iv)$u^2=\frac{17}{4}$

SECTION-B

7. Insert a rational number and an irrational number between the following

(i) 0.15 and 0.16 (ii) 2 and (iii) 2.357 and 3.121

8. Represent the real number $\sqrt{2}$, $\sqrt{3}$, $\sqrt{5}$ on a single number line.

9. Find two rational number and two irrational number between $\sqrt{2}$ and $\sqrt{3}$.

10. Simplify the following:

i) √45-3√20+4√5 ii) 3√3+2√27+$\frac{7}{\sqrt{3}}$ iii) (√9+√5) (√9-√5)

10. Find three rational numbers between

i)-1 and -2 ii) 0.1 and 0.11

iii) $\frac{5}{7}$ and $\frac{6}{7}$ iv) $\frac{1}{4}$ and $\frac{1}{5}$

11. Insert a rational number and an irrational number between the following:

i) 2 and 3 ii) 0 and 0.1 iii) $\frac{1}{3}$ and $\frac{1}{2}$ iv) $\frac{-2}{5}$ and $\frac{1}{2}$

v) 0.15 and 0.16 vi) 2 and vii) 2.357 and 3.121

12. Represent the following on number line:

7, 7.2, $\frac{-3}{2}$, $\frac{-12}{5}$

13. Locate √5, √10 and√ 17 on number line.

14. Simplify the following:

i) 4√28÷3√7÷√7 (ii) $(\sqrt{3}-\sqrt{2})^2$ (iii) $\frac{3}{\sqrt{8}}+\frac{1}{\sqrt{2}}$

15. rationalize the denominator of the following:

i) $\frac{2}{3\sqrt{3}}$ ii) $\frac{\sqrt{40}}{\sqrt{3}}$ iii) $\frac{3+\sqrt{2}}{4\sqrt{2}}$ iv) $\frac{16}{\sqrt{41}-5}$

SECTION –C

16. If a=$\frac{3+\sqrt{5}}{2}$, then find the value of $a^2-\frac{1}{a^2}$

17. If a=2+√3, then find the value of a-$\frac{1}{a}$.

18. Represent geometrically the following numbers on number line:

i) √ 4.5 ii) √5.6 iii) √ 8.1 iv) √ 2.3

19. Express the following in the form $\frac{p}{q}$ and q≠0:

i) 0.2727… ii) 0.888… iii) $5.2^{\overline{}}$ iv) $0.001^{\overline{}}$

v) 0.2555… vi) $0.134^{\overline{}}$ vii) 0.00323232 viii) 0.404040

20. Simplify the following expressions

$(\sqrt{3}+1)(1-\sqrt{12})+\frac{9}{\sqrt{3}+\sqrt{12}}$

21. If a= $\frac{2-\sqrt{5}}{2+\sqrt{5}}$ and b= $\frac{2+\sqrt{5}}{2-\sqrt{5}}$, find a^2-b^2

SECTION –D

22. Find a and b

(i) $\frac{7-\sqrt{5}}{7+\sqrt{5}}-\frac{7+\sqrt{5}}{7-\sqrt{5}}=a+\frac{7}{11}\sqrt{5}b$ (ii) $\frac{\sqrt{2}+\sqrt{3}}{3\sqrt{2}-2\sqrt{3}}=2-b\sqrt{6}$

23. Find x and y

(i) $\frac{5+2\sqrt{3}}{7+4\sqrt{3}}=x-6\sqrt{3}y$ (ii) $\frac{3-\sqrt{5}}{3+2\sqrt{5}}=x\sqrt{5}-\frac{19}{11}y$

24 Evaluate:

$\frac{1}{\sqrt{2}+1}+\frac{1}{\sqrt{3}+\sqrt{2}}+\frac{1}{\sqrt{3}+\sqrt{4}}+\ldots\ldots\ldots+\frac{1}{\sqrt{9}+\sqrt{8}}$

25. If x= $\frac{\sqrt{2}+1}{\sqrt{2}-1}$ and y = $\frac{\sqrt{2}-1}{\sqrt{2}+1}$, find the value of x^2+y^2+xy.

26. If x= $\frac{1}{2+\sqrt{3}}$, find the value of $2x^3-7x^2-2x+1$.

ARMY PUBLIC SCHOOL BINNAGURI
PRACTICE SHEET - 4
MATHEMATICS
CLASS – IX

POLYNOMIALS

SECTION –A

1. Factorize: $4x^2 + 9y^2 + 16z^2 + 12xy - 24yz - 16xz$
2. Expand $(4a - 2b - 3c)^2$.
3. Find the value of k, if $x - 1$ is a factor of $4x^3 + 3x^2 - 4x + k$.
4. Factorize $y^2 - 5y + 6$
5. Find the value of $(525)^2 - (475)^2$

SECTION-B

6. Find the value of $x^3 + y^3 + 15xy - 125$ if $x + y = 5$.
7. Without actually calculating, find the value of $(25)^3 - (75)^3 + (50)^3$.
8. Find the value of a,
   (i) if $x - a$ is a factor of $x^3 - ax^2 + 2x + a - 1$.
   (ii) if $x + 6$ is a factor of $x^3 + 3x^2 + 4x + a$.
9. Factorize $6x^2 + 17x + 5$.
10. Factorize: **(i)** $x^3 + 216y^3 + 8z^3 - 36xyz$
    (ii) $a^3 - 64b^3 - 27c^3 - 36abc$
11. Simplify: $(2x - 5y)^3 - (2x + 5y)^3$.
12. Show that $p(x) = x^3 - 3x^2 + 2x - 6$ has only one real zero.
13. Factorize the following: (i) $9x^2 + 6x + 1 - 25y^2$.
    (ii) $a^2 + b^2 + 2ab + 2bc + 2ca$
14. .Multiply: $x^2 + 4y^2 + z^2 + 2xy + xz - 2yz$ by $(-z + x - 2y)$.
15. If $a + b + c = 5$ and $ab + bc + ca = 10$, then prove that $a^3 + b^3 + c^3 - 3abc = -25$
16. Verify whether 2 and 0 are zeroes of the polynomial $x^2 - 2x$.
17. Find the remainder obtained on dividing $p(x) = x^3 + 1$ by $x + 1$.

SECTION-C

18. .If polynomials $ax^3 + 3x^2 - 3$ and $2x^3 - 5x + a$ leaves the same remainder when each is divided by **x**– 4, find the value of a..
19. If the polynomials $az^3 + 4z^2 + 3z - 4$ and $z^3 - 4z + a$ leave the same remainder when divided by **z**– 3, find the value of a.
20. Find the values of a and b so that the polynomial $x^3 - 10x^2 + ax + b$ is exactly divisible by $(x - 1)$ as well as $(x - 2)$.
21. Divide the polynomial $3x^4 - 4x^3 - 3x - 1$ by $x - 1$.

22. Check whether p(x) is a multiple of g(x) or not, where $p(x) = x^3 - x + 1$, $g(x) = 2 - 3x$.

23. If $x^3 + ax^2 + bx + 6$ has $(x - 2)$ as a factor and leaves a remainder 3 when divided by $(x - 3)$, find the values of a and b.

24. .Divide $p(x)$ by $g(x)$, where $p(x) = x + 3x^2 - 1$ and $g(x) = 1 + x$.

25. Check whether the polynomial $q(t) = 4t^3 + 4t^2 - t - 1$ is a multiple of $2t + 1$.

SECTION-D

26. The polynomial $p(x) = x^4 - 2x^3 + 3x^2 - ax + 3a - 7$ when divided by $x + 1$ leaves the remainder 19. Find the values of a. Also find the remainder when $p(x)$ is divided by $x + 2$.If both $x - 2$ and $x - \frac{1}{2}$ are factors of $px^2 + 5x + r$, show that $p = r$.

27. without actual division, prove that $2x^4 - 5x^3 + 2x^2 - x + 2$ is divisible by $x^2 - 3x + 2$.

28. The polynomial $f(x) = x^4 - 2x^3 + 3x^2 - ax + b$ when divided by $(x - 1)$ and $(x + 1)$ leaves the remainders 5 and 19 respectively. Find the values of a and b. Hence, find the remainder when f(x) is divided by $(x - 2)$.

29. If the polynomials $2x^3 + ax^2 + 3x - 5$ and $x^3 + x^2 - 2x + a$ leave the same remainder when divided by $(x - 2)$, find the value of a. Also, find the remainder in each case.

30. Without actual division, prove that $2x^4 - 6x^3 + 3x^2 + 3x - 2$ is exactly divisible by $x^2 - 3x + 2$.

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