ADARSHA VIDYALAYA HUNASHYAL P.B

SUBJECT : MATHEMATICS

MATHEMATICS FA – 1

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2	***SQUARE ,SQUARE ROOTS CUBES AND CUBE ROOTS***	***ARITHMETIC***	***FA - 1***
3	***RATIONAL NUMBERS***	***ARITHMETIC***	***FA – 2***
4	**COMMERCIAL ARITHMETIC**	***ARITHMETIC***	***FA – 3***
5	**STATISTICS**	***ARITHMETIC***	***FA – 4***
6	**ALGEBRAIC EXPRESSIONS**	**ALGEBRA**	***FA - 1***
7	**FACTORIZATION**	**ALGEBRA**	***FA – 2***
8	**EXPONENTS**	**ALGEBRA**	***FA – 2***
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FA – 1 [UNIT - 1 PLAYING WITH NUMBERS

REVISION

1. Write 54 and 254 in generalized form

Ans: 54 = (5 x 10) + (4 x 1) 254 = (2 x 100) + (5 x 10) + (4 x 1)

2. Find the digit represented by 'p' in the following addition.

Solution:

$$\begin{array}{cccc} & 4 & 1 & P \\ + & Q & 1 & 5 \\ \hline & 5 & 2 & 6 \\ \hline \end{array}$$

You see that P, being a digit, cannot exceed 9. The only way you can arrive to 6 from 5 is adding 1. Hence $P = 1$. Similarly, you get $Q = 1$. You may check that $411 + 115 = 526$.

3. Write the remainder and quotientwhen 85 is divided by 15

Ans:- here quotient is 5 and remainder is 10

$$\begin{array}{r} 15\,)\,85\,(\,5 \\ 75 \\ \hline 10 \\ \hline \end{array}$$

4.Write the quotient and remainder in the following when each of the following is divided by 13.

41, 49, 85,

5. is 444445 divisible by 3

Solution : The sume of the digits is 4+ 4 + 4 + 4 + 4 + 5 = 25. which is not divisible by 3 .

6. Check whether 12456 is divisible by 4

Solution : Here, the number formed by the last two digits is 56. This is divisible by 4

7. An integer a is divisible by 5 if and only if it ends with 0 or 5

Example : 125 , 145, 165 , 175 etc.,

8. Using numbers from 1 to 9 construct a 3 x 3 magic square . What is the magic sum here.

NOTE:

Given any two integers a and $b > 0$, there exist unique integers q and r such that $a = bq + r$, where $0 \leq r < b$.

A number is divisible by 4 if and only if the number formed by the last two digits is divisible by 4.

2	7	6
9	5	1
4	3	8

A number is divisible by 3 or 9 if and only if the sum of the digits is divisible by 3 or 9 respectively.

A number is divisible by 5 if and only if it ends in 0 or 5.

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FA – 1 [UNIT - 1] PLAYING WITH NUMBERS

Marks: 10

NAME:

1. Write 54 and 254 in generalized form

---------- 2 X 5 = 10

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2. **Find the digit represented by 'p' in the following addition.**

$$\begin{array}{rrr} & 4 & 1 & P \\ + & Q & 1 & 5 \\ \hline & 5 & 2 & 6 \end{array}$$

3.Write the remainder and quotient when 85 and 105is divided by 15

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4. Check whether 12456 and 3456is divisible by 4

---

5. Using the numbers from 3 to11 construct a 3 x 3 magic square . What is the magic sum here.

FA – 1 Unit : - 2 Topic : ALGEBRAIC EXPRESSION

REVISION FOR STUDENTS

TRUE OR FALSE

SL.NO	STATEMENT	ANS	Example	TRUE/FALSE
1	An algebraic expression in which each term contains only the variable[s] with non negative exponent[s] is called	polynomial	$x^2 - 4x$ $x - 4xy + y$,	TRUE
2	A polynomial which contains only one term is called a	Monomial.	$6x$, $8xy$, $7x^2y$, $5x^2yz$	TRUE
3	A polynomial which contains two terms is called a	Binomial	$7 + x$, $5xy - 3x$ $3x^2 - 6xy$	TRUE
4	A polynomial which contains three terms is called a	Trinomial.	ax^2+bx+c $x^2 + 8x + 12$	TRUE
5				

II. Add $7x^2 - 4x + 5$ and $9x - 10$ Here there are unlike terms. We can add only like terms. We write like terms one below the other to facilitate easy addition.

Example 3. Add $8xy + 4yz - 7zx$, $6yz + 11zx - 6y$ and $-5xz + 6x - 2yx$.

Solution: Here the again there are many unlike terms. We write like terms one below the other to facilitate easy addition. We are also using the commutative property: $xy = yx$ and $xz = zx$.

$$\begin{array}{rrrrr} 7x^2 & -4x & +5 & & \\ & +9x & -10 & & \\ \hline 7x^2 & +5x & -5 & & \end{array}$$

$$\begin{array}{rrrrr} 8xy & +4yz & -7zx & & \\ & +6yz & +11x. & & -6y \\ -2xy & & -5zx & +6x & \\ \hline +6xy & +10yz & -xy & +6x & -6y \end{array}$$

Multiplication of Polynomials

Observe the following products: (i) $5x \times 6x^2 = (5 \times 6) \times (x \times x^2) = 30x^3$;

(ii) $2x \times 6y \times 8z = (2x \times 6y) \times (8z)$

$= ((2 \times 6) \times (x \times y)) \times (8z) = (12xy) \times (8z)$

$= (12 \times 8) \times (xy \times z) = 96xyz.$

1. Find the product of : [a] 4x x 5y x 7z = 20xy x 7z = 140 xyz [b] $2l^2m \times 3lm^2 = 6l^3m^3$.

2. Determine the product (8y + 3) x 4x : Solution:

$$\begin{aligned} (8y+3) \times (4x) &= (4x) \times (8y+3) \\ &= (4x \times 8y) + (4x) \times 3 \\ &= 32xy + 12x. \end{aligned}$$

13. Complete the following table of products of two monomials.

First second	$3x$	$-6y$	$4x^2$	$-8xy$	$9x^2y$	$-11x^3y^2$	$15x$
$3x$	$9x^2$	$-18xy$	$12x2$	$-24x^2y$	$27x3y$	$-33x^4y^2$	$-45x^2$
$-6y$							
$4x^2$							
$-8xy$							
$9x^2y$							
$-11x^3y^2$							
$-12x$							

4. simplify : $(x + a)(x + b) = x(x + b) + a(x + b) = x^2 + xb + ax + ab$

$= x^2 + ax + bx + ab$

$= x^2 + (a + b)x + ab$

5. Find the product of $(x + 5)(x + 7) = x^2 + (5 + 7)x + (5 \times 7)$

$= x^2 + 12x + 35.$

$x^2 + (a + b)x + ab$

6. Find the product of 103 x 98 using suitable identity

$103 \times 98 = (100 + 3)(100 - 2)$

$= (100)^2 + [(3 + (-2)]\,100 + (3 \times (-2)$

$= 10000 + [(1 \times 100)] + (-6)$

$= 10000 + 94 = 10094$

$a(a + b) + b(a + b)$

$= a^2 + ab + ab + b^2$

$= a^2 + 2ab + b^2$

7. Expand : $(a + b)^2 =$

8. $a^2 - b^2 = (a + b)(a - b)$

9. $(a - b)^2 =$

$a(a - b) - b(a - b)$

$= a^2 - ab - ab + b^2$

$= a^2 - 2ab + b^2$

10. Find $(3x + 4y)^2 =$

Solution: we use identity : $(a + b)^2 = (a^2 + 2ab + b^2)$.

Taking $a = 3x$ *and* $b = 4y$, *we get*

$(3x + 4y)^2 = (3x)^2 + 2(3x)(4y) + (4y)^2$

$= 9x^2 + 24xy + 16y^2.$

11. Find $(2p - 4q)^2 =$

Solution: we use identity : $(a - b)^2 = (a^2 - 2ab + b^2)$.

Taking $a = 2p$ *and* $b = 4q$, *we get*

$(2p - 4q)^2 = (2p)^2 - 2(2p)(4q) + (4q)^2$

$= 4p^2 - 16pq + 16q^2.$

12.Compute : 54×46

Solution: Here; again identities is used

$(a + b)(a - b) = a^2 - b^2.$

Taking $a = 50$ *and* $b = 4$

$54 \times 46 = (50 + 4)(50 - 4)$

$= (50)^2 - (4)^2.$

$= 2500 - 16 = 2484$

1. Find the product:
   (i) $(a+3)(a+5)$ (ii) $(3t+1)(3t+4)$
   (iii) $(a-8)(a+2)$ (iv) $(a-6)(a-2)$.
2. Evaluate using suitable identities :
   (i) 53×55 (ii) 102×106 (iii) 34×36
   [3] [a] $(5x - 6y)^2$. [b] $(7x - 8y)^2$.
   [c] $(10x - 9y)^2$. [d] $(2x - 11y)^2$.

FA – 1 class : 8 Unit : - 2 Topic : ALGEBRAIC EXPRESSION marks: 10

1. TRUE OR FALSE *1 x 4 =4*

SL.NO	STATEMENT	ANS	Example	TRUE/FALSE
1	An algebraic expression in which each term contains only the variable[s] with non negative exponent[s] is called	Binomial	$x^2 – 4x$ $x – 4xy +y$,	
2	A polynomial which contains only one term is called a	Monomial.	$6x$, $8xy$, $7x^2y$, $5x^2yz$	
3	A polynomial which contains two terms is called a	polynomial	$7 + x$, $5xy – 3x$ $3x^2 – 6xy$	
4	A polynomial which contains three terms is called a	Trinomial.	$ax^2+bx +c$ $x^2 + 8x + 12$	

2. Expand the following using suitable identities:

1. $(x + a)(x + b) = x^2 + (a + b)x + ab$ *[2]* $(a + b)^2 = a^2 + 2ab + b^2$. *[3]* $(a – b)^2 = a^2 – 2ab + b^2$.

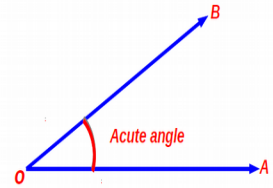
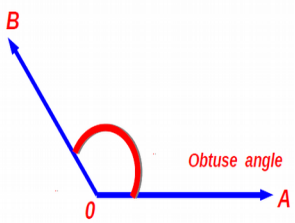
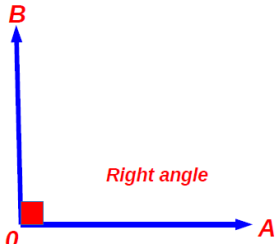
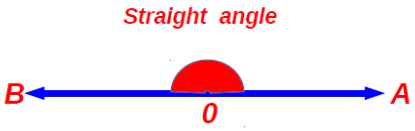
4. $(a + b)(a – b) = a^2 – b^2$.

[a] 103×98 *[b]* $(3x + 4y)^2$ *[c]* $(2p – 4q)^2$ *[d]* 54×46 *1 ½ x 4 =6*

FA – 1 class : 8 Unit : - 3 Topic : AXIOMS POSTULATES THEOREMS
REVISION FOR STUDENTS.

SL.NO	STATEMENT		
1	Things which are equal to the same things are equal to one another	AXIOM – 1	TRUE
2	If equals are added to equals, the wholes are equal.	AXIOM – 2	TRUE
3	If equals are subtracted from equals, then the remainders are equal.	AXIOM – 3	TRUE
4	Things which coincide with one another must be equal to one another.	AXIOM – 4	TRUE
5	The whole is greater than the part.	AXIOM – 5	TRUE
6	A straight line segment can be drawn joining any two points.	Postulate – 1	TRUE
7	Any straight line segment can be extended indefinitely in a straight line.	Postulate – 2	TRUE
8	Given any straight line segment, a circle can be drawn having the segment as radius and one end point as center	Postulate – 3	TRUE
9	All right angles are congruent.	Postulate – 4	TRUE
10	If a straight line meets two other lines, so as to make the two interior angles on one side of it together less than two right angles, the other straight lines will meet if produced on that side on which the angles are less than two right angles.	Postulate – 5	TRUE

II. Name the following:

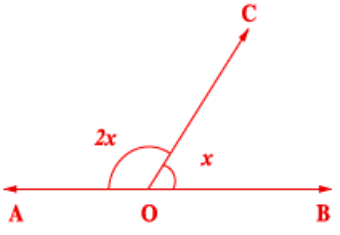
			
An acute angle is one have measure less than 90°	An obtuse angle is that angle which measures more than 90° but less than a straight angle	A right angle is that which measures 90°	It measures any straight angle exactly 180°

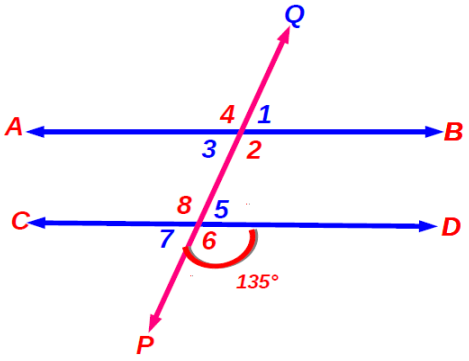
12. Find the value of 'x' in the given diagram:

$\angle AOC + \angle COB = 180^o$

$2x + x = 180°$

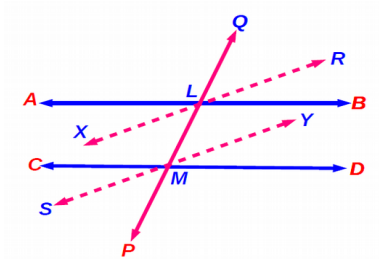
$3x = 180° \rightarrow x° = \frac{180°}{3} = 60°$ so $\angle AOC = 2x = 2 \times 60° = 120°$.





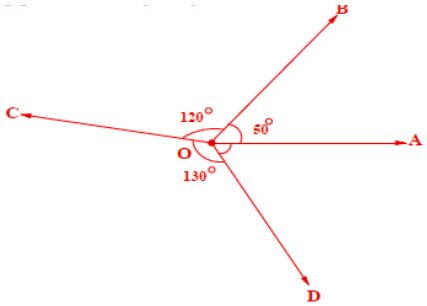
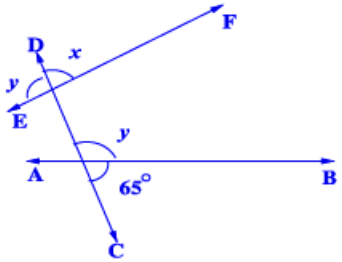
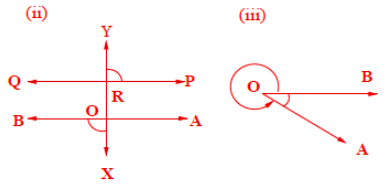
13. Find all angles in the given figure.

Here ∟1 and ∟3 are vertically angles
Here ∟4 and ∟2 are vertically angles= 135°
Here ∟5 and ∟7 are vertically angles= 45°
Here ∟8 and ∟6 are vertically angles= 135°
Here ∟4 and ∟1 are adjacent angles
Here ∟3 and ∟2 are adjacent angles
Here ∟8 and ∟5 are adjacent angles
Here ∟7 and ∟6 are adjacent angles= 180° - 135° = 45°
Here ∟1 and ∟5 are corresponding angles
Here ∟3 and ∟5 are alternate angles
Here ∟2 and ∟8 are corresponding angles
similarly we can write [for more information page no 44 theorem - 1]
∟2 = ∟6 , ∟4 = ∟8 , ∟3 = ∟7 , ∟1 = ∟7 , ∟4 = ∟6 ,



Example 6. Show that the angle bisectors of a pair of alternate angles made by the transversal with two parallel lines are parallel to each other.

Complete angle: *an angle which measures 360*
Reflex angle: *an angle which measures more than 180 but less than 360°*

		
Which pair of angles are supplementary	Find 'x'	***What type of angles***

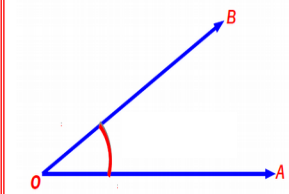
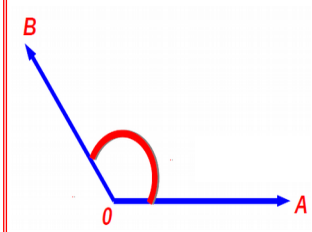
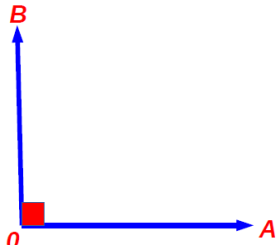
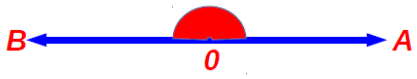
14.Define Playfair's postulate : *Given a line in a plane and a point outside the line in the same plane, there is a unique line passing through the given point and parallel to the given line.*
15.Proposition 5: *If a transversal cuts two parallel lines, then the sum of two interior angles on the same side of the transversal is equal to 180°*
16.Proposition 6 : *If a transversal cuts two distinct straight lines in such a way that the sum of two interior angles on the same side of the tr ansversal is equal to 180°, then the two lines are parallel to each other.*
Linear pair: *a pair of angles which make a starlight line.*
Vertically opposite angles: *when two straight lines intersect each other, a pair of angles which do not form a linear pair are vertically opposite angles.*
Collinear: *points all lying on the same straight line.*
Parallel lines: *A pair of lines which do not intersect in*

FA – 1 class : 8 Unit : - 3 Topic : AXIOMS POSTULATES THEOREMS Ma rks:

10I. Write True or False *½ X 10 = 5*

SL.NO	*STATEMENT*		*ANS*
1	*Things which are equal to the same things are equal to one another*	*AXIOM – 4*	
2	*If equals are added to equals, the wholes are equal.*	*AXIOM – 2*	
3	*If equals are subtracted from equals, then the remainders are equal.*	*AXIOM – 3*	
4	*Things which coincide with one another must be equal to one another.*	*AXIOM – 1*	
5	*The whole is greater than the part.*	*AXIOM – 5*	
6	*A straight line segment can be drawn joining any two points.*	*Postulate – 5*	
7	*Any straight line segment can be extended indefinitely in a straight line.*	*Postulate – 3*	
8	*Given any straight line segment, a circle can be drawn having the segment as radius and one end point as center*	*Postulate – 2*	
9	*All right angles are congruent.*	*Postulate – 4*	
10	*If a straight line meets two other lines, so as to make the two interior angles on one side of it together less than two right angles, the other straight lines will meet if produced on that side on which the angles are less than two right angles.*	*Postulate – 1*	

II. Name the following: *1 ½ x 4 = 2*

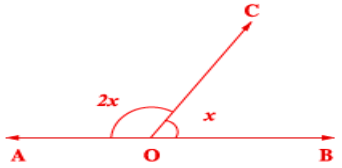
II. In the given figure Name *1x 3 =*

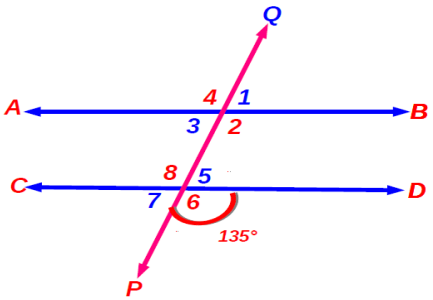
3[a]Alternate angles

[b] Vertically Opposite angles

[c] Adjacent angles *OR*

. Find the value of 'x' in the given diagram:





FA – 1 class : 8 Unit : - 4 Topic : Square, Square roots , Cube cube roots REVISION

I. Express the following statements mathematically(I) square of 4 is 16 (ii) square of 8 is 64 (iii) square of 15 is 225.Solution: $4_2 = 16$. $8_2 = 64$. $5_2 = 225$.2. Identify the perfect squares among the following numbers1,2,3,8,36,49,65,67,71,81,169,625,125,900,100,1000, 100000. Solution: 1, 36 , 49, 81, 169, 625, 900, 100, 3. Make a list of all perfect squares from 1 to 500.

1	4	9	16	25	36	49	64
81	100	121	144	169	196	225	256
289	324	361	400	441	484	529	576
625	676	729	784	841	900	961	1024
1089	1156	1225	1296	1369	1444	1521	1600
1681	1764	1849	1936	2025	2116	2209	2304
2401	2500	2601	2704	2809	2916	3025	3136

4. Find the square root of the following numbers by factorization:
(i) 196 (ii) 256 (iii) 10404 (iv) 1156 (v) 13225.

2 | 196 2 | 98 7 | 49 7 | 7 1	2 | 256 2 | 128 8 | 64 8 | 8 1	2 | 1156 2 | 578 17 | 289 17 | 17 1
$2^2 \times 7^2 = 2 \times 7 = 14$	$2^2 \times 8^2 = 2 \times 8 = 16$	$2^2 \times 17^2 = 2 \times 17 = 34$

5.Simplify: [I] $\sqrt{100} + \sqrt{36}$ *[ii]* $\sqrt{1360+9}$ *[iii]* $\sqrt{2704} + \sqrt{144} + \sqrt{289}$ *[iv]* $\sqrt{225} - \sqrt{25}$ *[v]* $\sqrt{1764} - \sqrt{1444}$ *[vi]* $\sqrt{169} - \sqrt{361}$

Solution: [I] 10 + 6 = 16 [ii] =37 [iii] 52 +12 + 17 = 81 [iv] 15 – 5 =10 [v] 42 – 38 = 4 [vi] 13 – 19 = - 6

ADARSHA VIDHYALAYA HUNASHYAL P.B

FA – 1 class : 8 Unit : - 4 Topic : Square & Cube roots Ma rks: 10

I. Express the following statements mathematically ½ X 4 = 2

(I) square of 4 is 16 (ii) square of 8 is 64 (iii) square of 15 is 225.(iv) square of 21 is 441

2.Find the square root of the following numbers by factorization:

(i) 196 (ii) 256 (iii) 1156 (vi) 13225. 1 x 4 = 4

5.Simplify: [I] $\sqrt{100} + \sqrt{36}$ ***[ii]*** $\sqrt{1360+9}$ ***1 x 4 = 4***

[v] $\sqrt{1764} - \sqrt{1444}$ ***[vi]*** $\sqrt{169} - \sqrt{361}$

NAME : ***MARKS:***