THE VILLAGE INTERNATIONAL SCHOOL

RECAP ACTIVITY – SETS

1. Write the set A = {1, 4, 9, 16, 25, . . .} in set-builder form.
2. Let A = {1, 2, 3, 4, 5, 6}. Insert the appropriate symbol $\in$ or $\notin$ in the blank
   spaces:
   (i) 5. . .A (ii) 8 . . . A (iii) 0. . .A
3. Write the following sets in roster form:
   (i) A = {x : x is an integer and $-3 \leq x < 7$}
   (ii) B = {x : x is a natural number less than 6}
   (iii) C = {x : x is a two-digit natural number such that the sum of its digits is 8}
4. Which of the following are examples of the null set
   (!) Set of odd natural numbers divisible by 2
   (ii) Set of even prime numbers
   (iii) { x : x is a natural numbers, $x < 5$ and $x > 7$}
5. Write down all the subsets of the following sets (i) {a} (ii) {a, b}
6. Write the following as intervals :
   (i) {x : x $\in$ R, $-4 < x \leq 6$}
   (ii) {x : x $\in$ R, $-12 < x < -10$}
   (iii) {x : x $\in$ R, $0 \leq x < 7$}
   (iv) {x : x $\in$ R, $3 \leq x \leq 4$}
7. Write the following intervals in set-builder form : (i) (– 3, 0) (ii) [6 , 12]
8. Find the union of each of the following pairs of sets :

(i) A = {x : x is a natural number and multiple of 3} B = {x : x is a natural number less than 6}

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9. If A = {x : x is a natural number }, B = {x : x is an even natural number} C = {x : x is an odd natural number}andD = {x : x is a prime number }, find (i) A ∩ B (ii) A ∩ C (iii) A ∩ D
10. Which of the following pairs of sets are disjoint

(i) {1, 2, 3, 4} and {x : x is a natural number and 4 ≤ x ≤ 6 }

(ii) { a, e, i, o, u } and { c, d, e, f }

11. If A = {3, 6, 9, 12, 15, 18, 21}, B = { 4, 8, 12, 16, 20 }, C = { 2, 4, 6, 8, 10, 12, 14, 16 }, D = {5, 10, 15, 20 }; find (i) A – B (ii) A – C (iii) A – D (iv) B – A
12. Let U = { 1, 2, 3, 4, 5, 6, 7, 8, 9 }, A = { 1, 2, 3, 4}, B = { 2, 4, 6, 8 } and C = { 3, 4, 5, 6 }. Find (i) A′ (ii) B′ (iii) (A ∪ C)′ (iv) (A ∪ B)′ (v) (A′)′
13. If A = {x : x is a natural number }, B = {x : x is an even natural number} C = {x : x is an odd natural number}andD = {x : x is a prime number }, find (i) A ∩ B (ii) A ∩ C (iii) A ∩ D
14. Which of the following pairs of sets are disjoint

(iii) {1, 2, 3, 4} and {x : x is a natural number and 4 ≤ x ≤ 6 }

(iv) { a, e, i, o, u } and { c, d, e, f }

15. If A = {3, 6, 9, 12, 15, 18, 21}, B = { 4, 8, 12, 16, 20 }, C = { 2, 4, 6, 8, 10, 12, 14, 16 }, D = {5, 10, 15, 20 }; find (i) A – B (ii) A – C (iii) A – D (iv) B – A
16. Let U = { 1, 2, 3, 4, 5, 6, 7, 8, 9 }, A = { 1, 2, 3, 4}, B = { 2, 4, 6, 8 } and C = { 3, 4, 5, 6 }. Find (i) A′ (ii) B′ (iii) (A ∪ C)′ (iv) (A ∪ B)′ (v) (A′)′

THE VILLAGE INTERNATIONAL SCHOOL

RECAP ACTIVITY – RELATIONS

1. If (x + 1, y – 2) = (3,1), find the values of x and y
2. If P = {a, b, c} and Q = {r}, form the sets P × Q and Q × P.
3. If the set A has 3 elements and the set B = {3, 4, 5}, then find the number of elements in (A×B).
4. Let A and B be two sets such that n(A) = 3 and n(B) = 2. If (x, 1), (y, 2), (z, 1) are in A × B, find A and B, where x, y and z are distinct elements.
5. 7Let A = {1, 2, 3, 4, 5, 6}. Define a relation R from A to A by R = {(x, y) : y = x + 1 } (i) Depict this relation using an arrow diagram. (ii) Write down the domain, codomain and range of R.
6. Determine the domain and range of the relation R defined by R = {(x, x + 5) : x ∈ {0, 1, 2, 3, 4, 5}}.
7. Let A = {x, y, z} and B = {1, 2}. Find the number of relations from A to B.
8. If A={1,4,8,9} and B={1, 2, -1, -2, -3, 3,5} and R is a relation from set A to set B {(x, y): $x=y^2$}. Write R in roster form.

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RECAP ACTIVITY – SEQUENCES AND SERIES

1. Find the next term of the sequence 2,8,32,128,…….
2. Find the indicated terms in each of the sequences in whose nth terms are:
   (i) a_n= 4n – 3; a_{12} , a_{15}
   (ii) $a_n = \frac{n^2}{2}$; a_5 , a_7
3. Write the first five terms of each of the sequences and obtain the corresponding series:
   (i) $a_1 = 3, a_n = 3a_{n-1} + 2$ for all n> 1
   (ii) $a_1 = -1$, $a_n = \frac{a_{n-1}}{n}$, n≥ 2
4. Find the 7th term of the sequence -5,-2,1,4,……85
5. The sums of n terms of two arithmetic progressions are in the ratio 3n+8: 7n+15. Find the ratio of their 12th terms.
6. Find the sum of the following series. (a) 4 + 7 + 10 + ... to 100 terms (b) 1 + 4 3 + 5 3 + 2 + ... to 19 term
7. The third term of a G.P. is 12. Find the product of its first five terms.
8. Find the 20th and n th terms of the G.P. $\frac{5}{2}, \frac{5}{4}, \frac{5}{8}$ … … …

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9. A manufacturer reckons that the value of a machine, which costs him Rs. 56200, will depreciate each year by 20%. Find the estimated value at the end of 3 years.
10. Insert two numbers between 3 and 81 so that the resulting sequence is G.P.
11. If AM and GM of two positive numbers x and y are 13 and 12 respectively, find the numbers.
12. Find the sum of the G.P. 1,3,9,27,……to 7 terms

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RECAP ACTIVITY – PERMUTATIONS AND COMBINATIONS

1. Evaluate (i) 5 ! (ii) 7 ! (iii) 7 ! – 5!
2. Compute(1) $\frac{7!}{5!}$ (2) $\frac{12!}{10!\ \ 2!}$
3. Compute $\frac{8!}{6!\times 2!}$
4. Express the following in factorial notation. (i) 6 × 7 × 8 × 9
   (ii) 4 × 5 × 6 × 7 × 8
5. How many 3-digit numbers can be formed from the digits 1, 2, 3, 4 and 5 assuming that
   (i) repetition of the digits is allowed?
   (ii) repetition of the digits is not allowed?
6. How many 3-digit even numbers can be formed from the digits 1, 2, 3, 4, 5, 6 if the digits can be repeated?
7. How many 4-letter code can be formed using the first 10 letters of the English alphabet, if no letter can be repeated?
8. .How many 5-digit telephone numbers can be constructed using the digits 0 to 9 if each number starts with 67 and no digit appears more than once?
9. Find the value of n such that
   ${}^{n}P_4 = 20\ {}^{n}P_2$, n > 3
   How many 3-digit numbers can be formed by using the digits 1 to 9 if no digit is repeated? 2. How many 4-digit numbers are there with no digit repeated? 3. How many 3-digit even numbers can be made using the digits 1, 2, 3, 4, 6, 7, if no digit is repeated? 4. Find the

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number of 4-digit numbers that can be formed using the digits 1, 2, 3, 4, 5 if no digit is repeated. How many of these will be even? 5. From a committee of 8 persons, in how many ways can we choose a chairman and a vice chairman assuming one person can not hold more than one position?

10. If nC8 = nC2 , find nC2 .
11. In how many ways can a team of 3 boys and 3 girls be selected from 5 boys and 4 girls?
12. Find the number of ways of selecting 9 balls from 6 red balls, 5 white balls and 5 blue balls if each selection consists of 3 balls of each colour.
13. Determine the number of 5 card combinations out of a deck of 52 cards if there is exactly one ace in each combination

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