

BRAIN INTERNATIONAL SCHOOL
ASSIGNMENT (2018-19)
SUBJECT- MATHEMATICS
CLASS -XI

SETS

1. Write the set $A = \{3,9,27,81,243,729\}$, $B = \{5,10,15,20,25\dots\}$ in the set builder form.
2. Write the following in roster form : (i) The set of all natural number less than 7
(ii) The set of all letters of the word "EQUATION".
3. Let $A = \{p,q,r,s\}$ $B = \{a,b,c,d\}$ $C = \{b, c, f, g\}$ be subsets of the set of $U = \{a, b, c, d, f, g, p,q,r,s\}$. Find (i) $A \cap B$ (ii) $A \cup (B \cap C)$ (iii) $A - B$ (iv) $(A \cup B)'$
4. Let $A = \{1,2,\{3,4\}\}$. Write all subsets and proper subsets.
5. If A and B are two sets such that $n(A)=24$ $n(B)=22$ and $n(A \cap B)=8$ find
(i) $n(A \cup B)$ (ii) $n(A-B)$
6. In an examination 56% of the candidates failed in English and 48% failed in science. If 18% failed in both English and science find the percentage of those who passed in both the subjects.
7. In a survey of 700 students in a college, 180 were listed as drinking Limca, 275 as drinking Mirinda and 95 were listed as drinking limca as well as Mirinda. Find how many students were drinking neither Limca nor Mirinda.
8. In a survey of 25 students, it was found that 15 had taken mathematics, 12 had taken physics and 11 had taken chemistry, 5 had taken mathematics and chemistry, 9 had taken mathematics and physics, 4 had taken physics and chemistry and 3 had taken all the three subjects. Find the number of students that had
(i) only chemistry (ii) only mathematics (iii) only physics (iv) physics and chemistry but not mathematics (v) mathematics and physics but not chemistry (vi) only one of the subjects (vii) atleast one of the three subjects (viii) none of the subjects.
9. A college awarded 38 medals in football, 15 in basketball and 20 in cricket. In these medals went to a total of 58 men and only 3 men got medals in all the three sports, how many received medals in exactly two of the three sports?
10. From 50 students taking examinations in Mathematics, Physics and Chemistry, each of the student has passed in at least one of the subjects, 37 passed Mathematics, 24 Physics and 43 Chemistry. At most 19 passed Mathematics and Physics, at most 29 Mathematics and Chemistry and at most 20 Physics and chemistry. What is the largest possible number that could have passed all three examinations?
11. Two finite sets have m and n elements respectively. The total number of subsets of first set is 56 more than the total number of subsets of the second set. Find the values of m and n.
12. Define Proper subset.
13. State de-morgan's law.
14. Write the following as intervals : (i) $\{x:x \in \mathbb{R}, -4 < x \leq 6\}$ (ii) $\{x:x \in \mathbb{R}, -12 < x < -10\}$
15. Given that $E = \{2,4,6,8,10\}$. If n represents any member of E, then write the following sets containing all members represented by $n+1$.
16. Given that $N = \{1,2,3,\dots,100\}$ then write subset A of N whose elements are odd numbers.
17. Write down all possible subsets of $A = \{1,\{2,3\}\}$

TRIGONOMETRY

1. Find in degrees the angle subtended at the centre of a circle of diameter 50 cm by an arc of length 11 cm.
2. A circular wire of radius 3 cm is cut and bent so as to lie along the circumference of a hoop whose radius is 48 cm . Find the angle in degrees which is subtended at the centre of the hoop.
3. A horse is tied to a post by a rope. If the horse moves along a circular path , always keeping the rope tight , and describes 88 metres when it traces 72° at the centre , find the length of the rope.
4. Find the value of : (i) $\sin(765^\circ)$ (ii) $\operatorname{cosec}(-1110^\circ)$ (iii) $\cot(-600^\circ)$
5. Evaluate: $\tan \frac{13\pi}{12}$
6. Find the value of $\cos \frac{\pi}{5} \cos \frac{2\pi}{5} \cos \frac{4\pi}{5} \cos \frac{8\pi}{5}$
7. Find the minimum value of $3 \cos x + 4 \sin x + 8$
8. Find the value of : $\sin 18^\circ$, $\cos 54^\circ$, $\cos 72^\circ$, $\sin 36^\circ$
9. Solve $2 \tan^2 x + \sec^2 x = 2$
10. Find value of $\sqrt{3} \operatorname{Cosec} 20^\circ - \sec 20^\circ$
11. Solve $\sqrt{3} \cos \theta + \sin \theta = \sqrt{2}$
12. Find the value of $(1 + \cos \frac{\pi}{8})(1 + \cos \frac{3\pi}{8})(1 + \cos \frac{5\pi}{8})(1 + \cos \frac{7\pi}{8})$
13. Find the value of $\tan 9^\circ - \tan 27^\circ - \tan 63^\circ + \tan 81^\circ$
14. Show that $2 + \sqrt{2 + 2 \cos 4\theta} = 2 \cos \theta$
15. Prove that $\cos 6^\circ \cos 42^\circ \cos 66^\circ \cos 78^\circ = \frac{1}{16}$
16. Show that $\sin 105^\circ + \cos 105^\circ = \frac{1}{\sqrt{2}}$
17. Prove that $\frac{\sec 8\theta - 1}{\sec 4\theta - 1} = \frac{\tan 8\theta}{\tan 2\theta}$
18. Prove that $\cot 2\theta + \tan \theta = \operatorname{cosec} 2\theta$
19. If $\tan \frac{x}{2} = \frac{m}{n}$. Prove that $m \sin x + n \cos x = n$
20. If $A + B + C = 90^\circ$. Prove that $\cot A + \cot B + \cot C = \cot A \cot B \cot C$
21. Prove that : $(\sin -420^\circ)(\cos 390^\circ) + (\cos -660^\circ)(\sin 330^\circ) = -1$