



## RAMAGYA SCHOOL, NOIDA

IX/MATHS/2018-19

### OLYMPIAD PRACTICE WORKSHEET

#### (Concept based)

1. If  $2^{x-3} \cdot 3^{2x-6} = 36$ , then the value of  $x$  is \_\_\_\_\_  
(A) 2 (B) 5 (C) 3 (D) 1
2. Express the mixed recurring decimal  $4.3\bar{2}$  in the form of  $\frac{p}{q}$   
(A)  $\frac{389}{90}$  (B)  $\frac{329}{90}$  (C)  $\frac{29}{90}$  (D)  $\frac{233}{990}$
3. If  $x = 7 + 4\sqrt{3}$ , then  $x + \frac{1}{x} =$  \_\_\_\_\_  
(A)  $8\sqrt{3}$  (B) 14 (C) 49 (D) 48
4. When  $p(x) = x^3 + ax^2 + 2x + a$  is divided by  $x + a$ , the remainder is \_\_\_\_\_  
(A) 0 (B)  $a$  (C)  $-a$  (D)  $2a$
5. If  $x + 2$  and  $x - 1$  are factors of  $x^3 + 10x^2 + mx + n$ , then value of  $m$  and  $n$  respectively are  
(A)  $-5, 5$  (B)  $7, 18$  (C)  $7, -18$  (D)  $-5, -18$

#### (Application based)

6. Rational number  $\frac{-18}{5}$  lies between consecutive integers \_\_\_\_\_  
(A)  $-2$  and  $-3$  (B)  $-3$  and  $-4$  (C)  $-4$  and  $-5$  (D)  $-5$  and  $-6$
7. The value of  $x$ , if  $5^{x-3} \cdot 3^{2x-8} = 225$  is \_\_\_\_\_  
(A) 3 (B) 4 (C) 2 (D) 5
8. Which of the following number has a terminating decimal representation?  
(A)  $\frac{5}{12}$  (B)  $\frac{8}{35}$  (C)  $\frac{7}{24}$  (D)  $\frac{13}{80}$
9. Given that  $x = 2$  is a solution of  $x^3 - 7x + 6 = 0$ , the other solutions are  
(A)  $-1, 3$  (B)  $1, -3$  (C)  $1, -2$  (D)  $-1, -2$
10. If  $x + k$  is a common factor of  $f(x) = x^2 + px + q$  and  $g(x) = x^2 + lx + m$ , then the value of  $k$  is \_\_\_\_\_  
(A)  $l + p$  (B)  $m - q$  (C)  $\frac{l-p}{m-q}$  (D)  $\frac{m-q}{l-p}$
11. Find the remainder when the expression  $3x^3 + 8x^2 - 6x + 1$  is divided by  $x + 3$   
(A) 1 (B) 10 (C) 6 (D) 0
12. If  $x^2 - 1$  is a factor of  $ax^4 + bx^3 + cx^2 + dx + e$  then

(A)  $a + b + e = c + d$     (B)  $a + b + c = d + e$     (C)  $b + c + d = a + e$     (D) none of these

13. The value of  $(x - a)^3 + (x - b)^3 + (x - c)^3 - 3(x - a)(x - b)(x - c)$ , when  $a + b + c = 3x$  is \_\_\_\_\_

(A) 3                      (B) 2                      (C) 1                      (D) 0

**(Value based)**

14. A rectangular field has an area  $35x^2 + 13x - 12$ . What could be the possible expressions for length and breadth of the field

(A)  $5x + 4$  and  $7x - 3$                       (B)  $3x + 9$  and  $7x - 12$     (C) Both (A) and (B)                      (D) None of these

15. Vikas has  $Dx^3 + 2ax + b$ , with this money he can buy exactly  $x - 1$  jeans and  $x + 1$  shirts with no money left. How much money Vikas has if  $x = 4$ ?

(A) D80                      (B) D120                      (C) D30                      (D) D60

**(Logical Reasoning)**

16. If  $x^4 + 1/x^4 = 47$ , then find the value of  $x^3 + 1/x^3$

(A) 7                      (B) 18                      (C) 6                      (D) 12

17. '+' stands for division, '÷' stands for multiplication, 'x' stands for subtraction and '-' stands for addition. Which one of the following equation is correct?

(A)  $18 \div 6 - 7 + 5 \times 2 = 20$     (B)  $18 + 6 \div 7 \times 5 - 2 = 18$     (C)  $18 \times 6 + 7 \div 5 - 2 = 16$     (D)  $18 \div 6 \times 7 + 5 - 2 = 22$

18. In a row of 40 boys, Satish was shifted 10 places to the right of Rohan and Kartik was shifted 10 places to the left of Vikas. If Vikas was 26 from the left and there were 3 boys between Kartik and Satish after shifting, what was the position of Rohan in the row?

(A) 10<sup>th</sup> from the right end    (B) 10<sup>th</sup> from the left end    (C) 39<sup>th</sup> from the right end    (D) Data inadequate

19 Complete the given series 4, 9, 13, 22, 35.....

(A) 57                      (B) 70                      (C) 63                      (D) 75

20. If the alphabet series is written in the reverse order, which letter will be 5<sup>th</sup> to the left of the 14<sup>th</sup> letter from the left?

(A) R                      (B) I                      (C) S                      (D) V