



# VIDYA BHARATI SCHOOL

OLYMPIAD WORKSHEET: October - 2017

GRADE: X

SUBJECT: MATHEMATICS

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- Q1. The distance between the points  $(\cos\theta, \sin\theta)$  and  $(\sin\theta - \cos\theta)$  is  
(a)  $\sqrt{3}$  (b)  $\sqrt{2}$  (c) 2 (d) 1
- Q2. The distance between the points  $(a \cos 25^\circ, 0)$  and  $(0, a \cos 65^\circ)$  is  
(a) a (b) 2a (c) 3a (d) None of these
- Q3. If x is a positive integer such that the distance between points P (x, 2) and Q(3, -6) is 10 units, then x =  
(a) 3 (b) -3 (c) 9 (d) -9
- Q4. If the distance between the points (4, p) and (1, 0) is 5, then p =  
(a)  $\pm 4$  (b) 4 (c) -4 (d) 0
- Q5. The perimeter of the triangle formed by the points (0, 0), (1, 0) and (0, 1) is  
(a)  $1 \pm \sqrt{2}$  (b)  $\sqrt{2} + 1$  (c) 3 (d)  $2 + \sqrt{2}$
- Q6. If A(2, 2), B(-4, 4) and C(5, -8) are the vertices of a triangle, then the length of the median through vertex C is  
(a)  $\sqrt{65}$  (b)  $\sqrt{117}$  (c)  $\sqrt{85}$  (d)  $\sqrt{113}$
- Q7. If the points (k, 2k), (3k, 3k) and (3, 1) are collinear, then k  
(a)  $\frac{1}{3}$  (b)  $-\frac{1}{3}$  (c)  $\frac{2}{3}$  (d)  $-\frac{2}{3}$
- Q8. If A(5, 3), B(11, -5) and P(12, y) are the vertices of a right triangle right angled at P, then y =  
(a) -2, 4 (b) -2, 4 (c) 2, -4 (d) 2, 4
- Q9. If (x, 2), (-3, -4) and (7, -5) are collinear, then x =  
(a) 60 (b) 63 (c) -63 (d) -60
- Q10. If the area of the triangle formed by the points (x, 2x), (-2, 6) and (3, 1) is 5 squares units, then x =  
(a)  $\frac{2}{3}$  (b)  $\frac{3}{5}$  (c) 3 (d) 5

- Q11. The line segment joining points  $(-3, -4)$ , and  $(1, -2)$  is divided by y-axis in the ratio  
 (a)  $1 : 3$                       (b)  $2 : 3$                       (c)  $3 : 1$                       (d)  $2 : 3$
- Q12. The ratio in which the x-axis divides the segment joining  $(3, 6)$  and  $(12, -3)$  is  
 (a)  $2 : 1$                       (b)  $1 : 2$                       (c)  $-2 : 1$                       (d)  $1 : -2$
- Q13. If the centroid of the triangle formed by the points  $(a, b)$ ,  $(b, c)$  and  $(c, a)$  is at the origin then  $a^3 + b^3 + c^3 =$   
 (a)  $abc$                       (b)  $0$                       (c)  $a + b + c$                       (d)  $3abc$
- Q14. The distance of the point  $(4, 7)$  from the x-axis is  
 (a)  $4$                       (b)  $7$                       (c)  $11$                       (d)  $\sqrt{65}$
- Q15. The distance of the point  $(4, 7)$  from the y-axis is  
 (a)  $4$                       (b)  $7$                       (c)  $11$                       (d)  $\sqrt{65}$
- Q16. The coordinates of the circumcentre of the triangle formed by the points  $O(0, 0)$ ,  $A(a, 0)$  and  $B(0, b)$  are  
 (a)  $(a, b)$                       (b)  $(a/2, b/2)$                       (c)  $(b/2, a/2)$                       (d)  $(b, a)$
- Q17. If the centroid of the triangle formed by the points  $(3, -5)$ ,  $(-7, 4)$ ,  $(10, -k)$  is at the point  $(k, -1)$ , then  $k =$   
 (a)  $3$                       (b)  $1$                       (c)  $2$                       (d)  $4$
- Q18. If the line segment joining the points  $(3, -4)$ , and  $(1, 2)$  is trisected at points  $P(a, -2)$  and  $Q\left(\frac{5}{3}, b\right)$ . Then,  
 (a)  $a = \frac{8}{3}, b = \frac{2}{3}$                       (b)  $a = \frac{7}{3}, b = 0$   
 (c)  $a = \frac{1}{3}, b = 1$                       (d)  $a = \frac{2}{3}, b = \frac{1}{3}$
- Q19. The point on the x-axis which is equidistant from points  $(-1, 0)$  and  $(5, 0)$  is  
 (a)  $(0, 2)$                       (b)  $(2, 0)$                       (c)  $(3, 0)$                       (d)  $0, 3$
- Q20. If  $A(x, 2)$ ,  $B(-3, -4)$  and  $C(7, -5)$  are collinear, then the value of  $x$  is  
 (a)  $-63$                       (b)  $63$                       (c)  $60$                       (d)  $-60$