Maths Worksheet

Class 9

Number System

1. Find a rational number lying between $\frac{1}{3}$ and $\frac{1}{2}$
2. Find six rational numbers between 3 and 4
3. Find three rational numbers between $\frac{1}{5}$ and $\frac{1}{4}$
4. Express $0.\overline{01}$ as a fraction in simplest form.
5. Express $0.5\overline{7}$ as a fraction in simplest form.
6. Represent $\sqrt{2}$ on the real line
7. Represent $\sqrt{3}$ on the real line
8. Represent $\sqrt{4.3}$ on the real line
9. Represent $\sqrt{9.3}$ on the real line
10. Simplfy (I) $(\sqrt{13} - \sqrt{6})(\sqrt{13} + \sqrt{6})$

    (II) $(\sqrt{6} + 6)(\sqrt{6} - 6)$

    (III) $(5 + \sqrt{6})(5 - \sqrt{6})$

    (IV) $(\sqrt{3} - \sqrt{2})^2$

    (V) $(\sqrt{7} - \sqrt{2})^2$

11. Add- (I) $(3\sqrt{2} + 7\sqrt{3})$ and $(\sqrt{2} - 5\sqrt{3})$

    (II) $(2\sqrt{3} - 5\sqrt{2})$ and $(\sqrt{3} + 2\sqrt{2})$

    (III) $(2\sqrt{2} + 5\sqrt{3} - 7\sqrt{5})$ and $(3\sqrt{3} - \sqrt{2} + \sqrt{5})$

12. Multiple (I) $3\sqrt{5}$ by $2\sqrt{5}$ (II) $6\sqrt{15}$ by $4\sqrt{3}$

    (III) $2\sqrt{6}$ by $3\sqrt{5}$ (IV) $3\sqrt{2}$ by $2\sqrt{3}$

13. Divide (I) $16\sqrt{6}$ by $4\sqrt{2}$ (II) $12\sqrt{15}$ by $4\sqrt{3}$ (III) $18\sqrt{21}$ by $6\sqrt{7}$

14. Rationalize the denominator of

   (I) $\frac{1}{3+\sqrt{2}}$ (II) $\frac{1}{8+5\sqrt{2}}$ (III) $\frac{1}{\sqrt{7}-\sqrt{6}}$ (IV) $\frac{2}{\sqrt{5}-\sqrt{3}}$ (V) $\frac{3}{\sqrt{5}+\sqrt{2}}$ (VI) $\frac{\sqrt{3}-1}{\sqrt{3}+1}$ (VII) $\frac{1}{\sqrt{7}}$

(VIII) $\frac{\sqrt{5}}{2\sqrt{3}}$ (IX) $\frac{1}{2-\sqrt{3}}$

15. If $x = (3 + \sqrt{8})$ find $(x^2 + \frac{1}{x^2})$

16. If $\frac{4+3\sqrt{5}}{4-3\sqrt{5}} = a + b\sqrt{5}$, find values of a and b

17. If $x = 4 - \sqrt{15}$ Find value of $(x + \frac{1}{x})$

18. Simplify –

(I) $6^{2/5} \times 6^{3/5}$ 　　 (II) $(32)^{\frac{1}{5}} \times 2$ 　　 (III) $3^{1/2} \times 3^{1/3}$ 　　 (IV) $2^5 \times 2^6$ 　　 (V) $(\frac{1}{3^4})^{1/2}$

(VI) $\dfrac{8^{1/2}}{8^{1/3}}$

19. If x= $(2+\sqrt{3})$ show that $(x^3+\frac{1}{x^3})$ = 52

20. If x = $\dfrac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ and $y = \dfrac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$

　　find $(x^2 + y^2)$

Polynomial

21. If $p(x) = 5 - 4x + 2x^2, Find\ p(0), p(3), p(-2)$
22. If $p(x) = x^2 + 3x + 2$ find $p(-1), p(-2), p(0)$
23. If $p(y) = 5y^3 - y^2 + 3y + 4$ find $p(-1), p(2), p(-2)$
24. Find the zeroes of poly nomial :
　　　a. $p(x) = x + 6$
　　　b. $p(x) = x - 7$
　　　c. $p(y) = 2y + 3$
　　　d. $p(t) = 3t - 6$
　　　e. $p(x) = ax, a \neq 0$
　　　f. $p(x) = 2x + 4$
25. Verify that :
　　　a. 5 is zero of polynomial p(x)=x-5
　　　b. -2 is zero of poly nomial p(y)=y+2
　　　c. -4 and -5 are zeros of polynomial p(x)=$x^2 + 9x + 20$
26. Find the remainder when the polynomial : $p(x) = x^4 + 2x^3 - 3x^2 + x - 1$ is divided
　　by $(x - 2)$ using remainder theorem.
27. Find the remainder when the polynomial $p(x) = x^3 - 3x^2 + 4x + 50$ is divided by (x+3)
　　Using remainder theorem.
28. Show that (x-3) is a factor of the polynomial $p(x) = x^3 + x^2 - 17x + 15$ Using
　　Factor Theorem

29. Show that (x+5) is a factor of the polynomial $p(x) = x^3 + x^2 + 3x + 115$
    Using
    Factor Theroem
30. Find the value of K for which (2x-1) is a factor of polynomial
    $p(x) = 2x^3 + kx^2 + 11x + k + 3$
31. Factories: $x(x - y)^3 + 3x^2y \ (x - y)$
32. Factories: $9x^2 + 12xy$
33. Factories: $x^2 + y - xy - x$
34. Factories: $25x^2 - 64y^2$
35. Factories: $150 - 6x^2$

36. Factories: $x^4 - 1$
37. Factories: $6x^2 + 7x - 3$
38. Factories:
    a. $x^2 + 3x + 2$
    b. $x^2 - 9x + 20$
    c. $9x^2 - 22x + 8$
39. Expand :
    a. $(2a + 3b + 4c)^2$
    b. $(3a - 5b - c)^2$
    c. $(-4x + 5y - 3Z)^2$
    d. $(2x - 3y + 4z)^2$
    e. $(x - y - z)^2$
40. Factories:
    a. $4x^2 + y^2 + z^2 - 4xy - 2yz + 4xz$
    b. $2x^2 + y^2 + z^2 - 4xy - 2yz + 4xz$
41. Expand :
    a. $(2 + 3x)^3$
    b. $(2x - 3y)^3$
    c. $\left(2x - \dfrac{2}{x}\right)^3$
    d. $(x + 2y)^3$
42. Factories :
    a. $x^3 + 64$
    b. $8x^3 + 27$
    c. $64x^3 - 125y^3$
43. Factories :
    a. $a^3 + 27b^3 + 8c^3 - 18abc$
    b. $a^3 - 8b^3 + 64c^3 + 24abc$
    c. $a^3 - b^3 + 1 + 3ab$

44. Prove that :
    a. $x^3 + y^3 = (x + y)(x^2 - xy + y^2)$
       $x^3 - y^3 = (x - y)(x^2 + xy + y^2)$
45. Prove that $(X+Y+Z)^2 = x^2+y^2+z^2+2xy+2yz+2zx$
46. Prove that $x^3+y^3+z^3-3xyz=(x+y+z)(x^2+y^2+z^2-xy-yz-zx)$
47. Prove that $x^3+y^3+z^3-3xyz=\frac{x+y+z}{2}[(x-y)^2+(y-z)^2+(z-x)^2]$
48. If x+y+z=0
       Prove that $x^3+y^3+z^3=3xyz$

49. find tha value of $(5a-7b)^3 + (9c-5a)^3 + (7b-9c)^3$

50. If x+y+4=0, find the value of $(x^3+y^3-12xy+64)$

3- Coordinate Geometry

51. Locate the following point an graph paper

(I) (4,3)   (II) (3,4)   (III) (2,-5)   (IV) (-3,2)   (V) (2,0)
(VI) (6,-2)   (VII) (0,-5)   (VIII) (-2,-3)   (IX) (0,2)   (X) (2,5)