WORKSHEET 1

Rational Numbers

Multiple Choice Questions

1. The sum of $\frac{21}{-4}$ and $\frac{7}{4}$ is:

   (a) $\frac{-7}{2}$ (b) 7 (c) $\frac{-7}{4}$ (d) $\frac{7}{2}$

2. $\frac{9}{10} \div \frac{-4}{5}$ is:

   (a) $\frac{9}{8}$ (b) $\frac{-15}{9}$ (c) $\frac{-9}{8}$ (d) $\frac{9}{15}$

3. The reciprocal of $\frac{-3}{7}$ is:

   (a) $\frac{3}{-7}$ (b) $\frac{3}{7}$ (c) $\frac{7}{3}$ (d) $\frac{-7}{3}$

4. The product of a rational number with its multiplicative inverse is:

   (a) 0 (b) 1 (c) not defined (d) –1

5. The additive inverse of $\frac{-11}{15}$ is:

   (a) $\frac{11}{15}$ (b) $\frac{-15}{11}$ (c) $\frac{11}{-15}$ (d) none of these

Mental Maths

6. What is $\frac{-2}{13} \times -1$?
7. $\left(\frac{p}{q}+\frac{r}{s}\right)+\frac{u}{v}=\frac{p}{q}+\left(\frac{r}{s}+\frac{u}{v}\right)$ is called commutative property of addition. (True/False)
8. What rational number should be added to $\frac{7}{15}$ to get 0?
9. By what number should $\frac{8}{13}$ be divided to give $\frac{-8}{9}$?
10. Simplify $\frac{3}{4} \times \frac{25}{9} \times \frac{8}{15}$
11. Simplify $\frac{4}{5} \times \frac{-5}{4} + 1$

Fill in the blanks.

12. Two rational numbers between $\frac{3}{8}$ and $\frac{7}{8}$ are _____ and _____.
13. $\frac{x}{y} \div 0$ = _____
14. $\frac{12}{7}$ lies to the _____ of 0 on a number line.
15. The value of $\frac{18}{57} \times \frac{105}{64} \times \frac{-17}{19} \times 0$ is _____.

Questions

16. Add $\frac{2}{-5}$ and $\frac{6}{-7}$.

17. Find two rational numbers between $\frac{3}{7}$ and $\frac{5}{6}$.

18. Subtract $\frac{3}{5}$ from $\frac{2}{3}$.

19. Show that $\frac{-7}{15}+\frac{8}{15}=\frac{8}{15}+\left(\frac{-7}{15}\right)$.

20. Simplify $\frac{3}{5}+\left(\frac{-11}{15}\right)+\frac{4}{6}+\left(\frac{-2}{3}\right)$

21. Represent the following rational numbers on a number line.

    (a) $\frac{2}{3}$ (b) $\frac{-5}{2}$ (c) $\frac{7}{4}$

22. Verify that $(x + y) + z = x + (y + z)$ for $x = \frac{-3}{4}$, $y = \frac{2}{5}$ and $z = \frac{-5}{9}$.

23. Arrange $\frac{-6}{17}, \frac{3}{17}, \frac{9}{17}, \frac{-5}{17}, \frac{-11}{17}$ in ascending order.

24. Simplify $\left\{\frac{2}{5}-\left(\frac{-3}{8}\right)\right\}\times\left\{\frac{-5}{7}+\left(\frac{-6}{15}\right)\right\}$

25. Divide the sum of $\frac{-7}{11}$ and $\frac{5}{8}$ by their difference.

WORKSHEET 2

Exponents (Powers)

Multiple Choice Questions

1. $\left(\frac{x}{y}\right)^{-n} =$ _____

   (a) $\left(\frac{y}{x}\right)^{-n}$ (b) $\left(\frac{y}{x}\right)^{n}$ (c) $\left(\frac{x}{y}\right)^{n}$ (d) none of these

2. The value of $(2^2 + 3 - 4^{1/3})^0$ is:

   (a) 1 (b) 0 (c) –1 (d) 2

3. The standard form of 0.00000398 is:

   (a) 3.98×10^6 (b) 3.98×10^{-5} (c) 3.98×10^{-6} (d) 3.98×10^5

4. The usual form of 1.608×10^3 is:

   (a) 16,080 (b) 160.80 (c) 16.080 (d) 1,608

5. $\left(\frac{2}{5}\right)^{-2}$ can be written in the form $\frac{p}{q}$ as:

   (a) $\frac{25}{4}$ (b) $\frac{2}{5}$ (c) $\frac{4}{25}$ (d) $\frac{5}{2}$

Mental Maths

6. Find the value of $\left(\frac{1}{4}\right)^{-1} + \left(\frac{1}{3}\right)^{-1} + \left(\frac{1}{2}\right)^{-1}$.

7. The standard form of 0.000003 is 3×10^{-6}. (True/False)

8. Find the value of x if $\left(\frac{5}{4}\right)^{4-x} = \left(\frac{5}{4}\right)^{5}$.

9. Simplify $\left(\frac{27}{125}\right)^{-2/3}$

Fill in the blanks.

10. The value of $\left[\left\{\left(\frac{6}{7}\right)^2\right\}^{3/4}\right]^0$ is _____.

11. The reciprocal of $\left(\frac{-2}{5}\right)^{-3}$ is _____.

12. $\{(-2)^{-3}\}^2$ is _____.

13. The value of $(2)^4 \times (2)^{-7}$ is _____.

14. $(x^m)^n =$ _____.

15. The usual form of $5.06 \times (10)^{-4}$ is _____.

Questions

16. Simplify $\left(\frac{-3}{4}\right)^{-4} \times \left(\frac{-2}{5}\right)^{2}$ and write the result in the form $\frac{p}{q}$.

17. Simplify $\left[\left(\frac{2}{3}\right)^{2}\right]^{3} \times \left(\frac{1}{3}\right)^{-3} \times \frac{1}{3} \times (9)^{-1}$.

18. Evaluate $\frac{(27)^{-1} \times (4)^{3}}{(3)^{-4}}$.

19. Evaluate $[(7)^{-1} - (8)^{-1}]^{-1} - [(3)^{-1} - (4)^{-1}]^{-1}$.

20. Evaluate $\left[\left(\frac{1}{3}\right)^{-3} - \left(\frac{1}{2}\right)^{-3}\right] \div \left(\frac{1}{4}\right)^{-3}$.

21. Simplify $\left[\left\{\left(\left(\frac{-2}{3}\right)^{-3}\right)^{2}\right\}^{2}\right]^{\frac{1}{6}}$

22. Simplify $\left[\left\{\left(\left(\frac{-1}{4}\right)^{-2} \times \left(\frac{3}{8}\right)^{2}\right)^{-3}\right\}^{-2}\right]^{\frac{1}{12}}$

23. Find the value of x if $\left(\frac{4}{5}\right)^{2x+1} \times \left(\frac{4}{5}\right)^{5} = \left(\frac{4}{5}\right)^{2+x}$.

24. By what number should $(3)^{-1}$ be multiplied to get the product $\left(\frac{-5}{9}\right)^{-1}$?

25. Express the following as a power with base 3.
    (a) $(9)^{-2}$ (b) $(27)^{3}$ (c) $(81)^{-4}$

WORKSHEET 3

Squares and Square Roots

Multiple Choice Questions

1. The units digit in the square of 699 is:
   (a) 3 (b) 1 (c) 9 (d) 7
2. Calculating mentally, the sum 1 + 3 + 5 + 7 + 9 + 1 is:
   (a) 26 (b) 49 (c) 81 (d) 25
3. The number of non-perfect square natural numbers that lie between the squares of 85 and 86 are:
   (a) 150 (b) 160 (c) 170 (d) 180
4. The value of $(9{,}999)^2$ is:
   (a) 9,99,80,001 (b) 99,88,001 (c) 9,88,80,001 (d) 9,99,88,001

Mental Maths

5. Write 17^2 as the sum of two consecutive natural numbers.
6. Write the Pythagorean triplet whose numbers are formed by the natural number 22.
7. The sum or difference of two square numbers is a square number. (True/False)

Fill in the blanks.

8. The digit in the units place of the square of 233 is _____.
9. The value of $(105)^2$ = _____.
10. The value of $(1{,}111)^2$ = _____.
11. The square of an even number is always _____.
12. The value of $\sqrt{\frac{36}{441}}$ is _____.
13. The sum of first n-odd natural numbers is _____.
14. The value of $15^2 - 14^2$ is _____.

Questions

15. Find $(29)^2$ using column method.
16. Find the square root of 1,764 by prime factorization method.
17. Find the square root of $\frac{2{,}401}{225}$.
18. Find the square root of 0.032041 by division method.
19. Find the square root of 2 upto three places of decimal.
20. Find the square of 94 using $(x - y)^2 = x^2 - 2xy + y^2$.
21. Given $\sqrt{2} = 1.414$, evaluate $\sqrt{\frac{49}{2}}$.
22. What is the least number by which 3,872 should be multiplied to make it a perfect square?
23. The area of a square field is 65,536 m^2. Find the side of the field.
24. Find the least number that should be added to 4,071 to make it a perfect square.