ASSIGNMENT FOR THE SESSION 2014-2015

Class: VIII **Subject : Mathematics** **Assignment No. 22**

Square and Square Roots

1. Find the least number of 4 digits which is a perfect square.
2. The area of a square play ground is 477.4225m^2. Find the side of the playgroud.
3. Simplify
   i) $\sqrt{400} + \sqrt{0.04} + \sqrt{0.000004}$
   ii) $\sqrt{212\sqrt{154 + \sqrt{225}}}$
4. If $\sqrt{4096} = 64$ then find the value of $\sqrt{40.96} + \sqrt{0.4096} + \sqrt{0.004096}$
5. Find the square roots of 2304 and 1764 and hence find the value of $\frac{\sqrt{0.2304} + \sqrt{0.1764}}{\sqrt{0.2304} - \sqrt{0.1764}}$
6. Find the smallest number which should be added to 3645 to make it a perfect square.

Cube and Cube Roots

1. Find the values of i) $\sqrt[3]{3375 \times 729}$ ii) $\sqrt[3]{\sqrt{0.000064}}$
2. Write in the simplest form i) $\sqrt[3]{125x^3y^6z^{12}}$ ii) $\sqrt[3]{\frac{216a^{18}}{729b^3}}$
3. If $\frac{\sqrt[3]{0.512}}{x} = \sqrt[3]{1000}$, then find the value of x .
4. Simplify: i) $\sqrt[3]{-27000}$ ii) $\sqrt[3]{0.001} \times 10$

Playing with numbers

1. If a 3 digit number 5x2 is divisible by 3. Find the smallest value of x.
2. If a 4 digit number 13y1 is divisible by 3. Find the smallest value of y.
3. If a 4 digit number 24x5 is divisible by 9. Find the smallest value of x.

OPERATIONS ON ALGEBRIC EXPRESSIONS

1. Re-arrange suitably and find the sum of the following:

a) $\frac{11}{12} + \frac{-17}{3} + \frac{11}{2} + \frac{-25}{2}$

b) $\frac{4}{13} + \frac{-5}{8} + \frac{-8}{13} + \frac{9}{13}$

2. Evaluate: $\frac{-12}{5} + \frac{-7}{20} + \frac{3}{14} + \frac{1}{7} + \frac{-1}{10}$
3. Simplify: $\left(\frac{3}{11} \times \frac{5}{6}\right) - \left(\frac{9}{12} \times \frac{4}{3}\right) + \left(\frac{5}{13} \times \frac{6}{15}\right)$
4. Multiply $\left(\frac{1}{2}x^2 + \frac{1}{3}x - 1\right) by \left(\frac{3}{4}x^3 - \frac{2}{3x} + \frac{1}{9}\right)$.
5. Find the product $(x^3 - 2x^2 + 5)(4x - 1)$

6. Divide $x^5 - x^4 + 3^3 + 4x^2 - 3x - 3$ by x^2+1

7. Divide $44(x^4 - 5x^3 - 24x^2)$ by $11x(x - 8)$

8. Divide $(5p^2 - 25p+20)$ by $(p - 1)$

9. Divide $96abc(32 - 12)(5b - 30)$ by $144(a - 4)(b - 6)$

10. Divide $63(p^4 + 5p^3 - 24p^2)$ by $9p(P+ 8)$

11. If $x^4 + \frac{1}{x^4} = 194$ find $x^2 + \frac{1}{x^2}$

12. If $\left(x - \frac{1}{x}\right) = 5$, find the value of $\left(x^2 + \frac{1}{x^2}\right)$.

13. If $x^2 + \frac{1}{x^2} = 27$, find $x - \frac{1}{x}$

14. If $x^3 + ax^2 - bx + 10$ is exactly divisible by $x^2 + 3x + 2$. Find the values of a and b?

15. What must be subtracted from $3x - 5x + 1$ to get $x - x + 5$

FACTORISATION

Factorise the following:

1. $x^2 + (a+b+c)x + ab+bc$
2. $x^4+x^2y^2 +y^4$
3. $a^{12} - 3a^4 + \frac{3}{a^4} - \frac{1}{a^{12}}$
4. $27-125x^3-135x+225x^2$
5. $3\sqrt{3}a^3 - b^3 - 5\sqrt{5}c^3 - 3\sqrt{15}abc$
6. $p^3(q-r)^3+q^3(r-p)^3+r^3(p-q)^3$
7. Factorise:
   a) $8x^2 - 6xy - 9y^2$
   b) $5x^6 - 7x^3 - 6.$
   c) $9(x - 2y)^2 - 4(x - 2y) - 13$
8. Factorize: $a^2 - b^2 - 4ac +4c^2$
9. Factorize: $x^2 + y - xy - x.$
10. Factorize: $25(x+ y)^2 - 36(x - 2y)^2$

1. Using the identity, evaluate: a) 95 x 96 b) 198 x 209 c) 194 x 189.

2. Evaluate using identity:
   a) 10.2 X 9.8 b) 198 X 198

3. Evaluate using identity:
   a) 8.3 X 7.7 b) 97 X 97

Linear equations

1. Solve the following equations.
   i) $\frac{2}{x} - \frac{5}{3x} = \frac{1}{3}$

ii) $\frac{2x+3}{5x}-\frac{7}{x}+4=\frac{2}{3x}$

iii) $6(x^2 - 3x + 2) - 2(x^2 - 1) = 4(x+1)(x+2) - 24.$

iv) $\frac{5x-5}{4x+7}=\frac{5x-31}{4x-23}$

v) $\frac{x^2+5x+4}{x^2+3x+2}=\frac{3}{2}, x \neq -1,-2$

vi) $\frac{4}{x+1}=\frac{3}{2x+1}+\frac{3}{x+3}$

vii) $\frac{x+3}{x-3}=2-\frac{x+2}{x-2}$

2. A steamer goes downstream from one port to another in 9 hours. It covers the same distance up steam in 10 hours. If the speed of the stream be 1km/hr. Find the speed of the steamer in still water and the distance between the ports.

3. When 4 is subtracted from three times a number and the result is divided by 3 more than the number we get 2/5. Find the number.

3. A man invested Rs 35,000; a part of it at an annual rate of 12% and he rest at 14%. If he received a total annual interest of Rs 4460. How much did he invest at each rate?

4. A man rowing at the rate of 5 km/hr in still water takes thrice as much time in going 40 km upstream as he takes in going 40km downstream. Find the rate at which the water is flowing. [Hint: $\frac{40}{5-x}=3\left(\frac{40}{5+x}\right)$

5. Two cars start from a certain town and travel in opposite directions. One goes towards north at 55km/hr and the other goes towards south at 35 km/hr. After how mach time will they be 135 km apart?

6. Two places A and B are 42 km apart. One person starts from A, walks at 4 km/hr towards B and meets another person coming from B towards A after 6 hours. Find the rate at which the second person is walking.

7. A man covers a distance of 15 km in 3 hours, partly by walking and partly by riding. If he walks at 3 km/hr and rides at 9 km/hr, find the distance he covered by riding.

   Hint: $\frac{x}{9}+\frac{15-x}{3}=3.$

8. Samir brought a shirt for Rs 336, including 12% sales tax and a necktie for Rs 110 including 10% sales tax. Find the printed price (without sales tax) of shirt and necktie together.

9. The difference between a two digit number and the number obtained by interchanging the position of its digits is 63. What is the difference between the two digits of that number?

10. A two digit number becomes five-sixth of itself when its digits are reversed. The two digits differ by One. What is the number?

11. The length of a rectangle exceeds its width by 3m. If the width is increased by 4m and the length is decreased by 6m , the area is decreased by 22sq.m.

PROFIT AND LOSS

1. By selling an article, Ramesh earned a profit equal to ¼th of the price he brought it. If he sold it for Rs 375, what was the cost price?

2. A dealer sold ¾ of his article at a gain of 20% and the remaining at cost price. Find the gain percent earned by him in the whole transaction.

3. A tradesman marks his goods 30% above the cost price. If he allows a discount of $6\frac{1}{4}\%$ then find his gain percent.

4. At what percent above the cost price. Must an article be marked so as to gain 33% after allowing a discount of 5%.

5. Sahid bought two old scooters for Rs 9000. By selling one at a profit of 25% and the other at a loss of 20%, he neither gains nor loses. Find the cost price of each scooter

6. By selling 90 ball pens for Rs. 160, a person loses 20%. How many ball pens should be sold for Rs 96, so as to have a profit of 20%.

7. Aman bought two articles for Rs: 30,000. By selling one at a loss of 15% and other at a gain of 19%, he found that the selling price of both the articles is the same. Find the cost price of each.

9. Which is more favourable to a buyer and by how much Rs680 with 14% discount or the same amount with successive discount of 10%, 5%?

10. Wasim brought two cricket bats for Rs 560 and Rs 240 respectively. He sells the first bat at a gain of 15% and the second one at a loss of 5%. Find his gain or loss percent in the whole transaction.

COMPOUND INTEREST

1. What sum will become Rs 5408 after 2 years at 4% per annum when the interest is compounded annually?

2. Find the annual rate of compound interest at which Rs 8000 will become Rs 10648 after 3 years.

3. After what time will Rs 5400 yield Rs 1373.63 as compound interest at 12% per annum?

4. The difference between C.I and S.I for 2 years at 5% sum of money is Rs 2.50. Find the sum

5. Find the principle, if the compound interest, compounded annually for 2 years at the rate of 10% p.a is Rs 6615.

6. The value of a refrigerator, which was purchased 2 years ago depreciates at 12% per annum. If its present value is Rs.9680, for how much was it purchased?

7 In how many rears compound interest on Rs 5000 will amount to Rs 624.32 at 8% per annum compounded half-yearly.

8. Find the rate of compound interest which will yield a compound interest of Rs 612.08 on a sum of Rs. 10,000 in 9 months, interest payable quarterly.

9. A sum amounts to Rs 9680 in 2 years and to Rs 10648 in 3 years compounded annually. Find the sum (principle) and the rate of interest per annum.

10. A sum compounded annually becomes 25/16 times of itself in 2 years. Determine the rate of interest per annum.

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