

ASSIGNMENT FOR THE SESSION 2014-2015

Class: VIII

Subject : Mathematics

Assignment No. 2

Square and Square Roots

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

Cube and Cube Roots

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

Playing with numbers

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

OPERATIONS ON ALGEBRIC EXPRESSIONS

- Re-arrange suitably and find the sum of the following:
 - $\frac{11}{12} + \frac{-17}{3} + \frac{11}{2} + \frac{-25}{2}$
 - $\frac{4}{13} + \frac{-5}{8} + \frac{-8}{13} + \frac{9}{13}$
- Evaluate: $\frac{-12}{5} + \frac{-7}{20} + \frac{3}{14} + \frac{1}{7} + \frac{-1}{10}$
- Simplify: $\left(\frac{3}{11} \times \frac{5}{6}\right) - \left(\frac{9}{12} \times \frac{4}{3}\right) + \left(\frac{5}{13} \times \frac{6}{15}\right)$
- Multiply $\left(\frac{1}{2}x^2 + \frac{1}{3}x - 1\right)$ by $\left(\frac{3}{4}x^3 - \frac{2}{3x} + \frac{1}{9}\right)$.
- 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) 95×96	b) 198×209	c) 194×189 .
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 2. Evaluate using identity:

a) 10.2×9.8	b) 198×198
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 3. Evaluate using identity:

a) 8.3×7.7	b) 97×97
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Linear equations

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

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

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

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

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

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

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

2. A steamer goes downstream from one port to another in 9 hours. It covers the same distance up stream 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 $\frac{2}{5}$. 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 $\frac{1}{4}$ th of the price he brought it. If he sold it for Rs 375, what was the cost price?

2. A dealer sold $\frac{3}{4}$ 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 years 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 $\frac{25}{16}$ times of itself in 2 years. Determine the rate of interest per annum.
