

Ratio and Proportion
Assignment

1. If $a : b = c : d$, prove that: $(2a + 3b)(2c - 3d) = (2a - 3b)(2c + 3d)$.
2. What number should be subtracted from each of the following numbers 23, 30, 57 and 78 so that remainders are in proportion?
3. If a, b, c are in continued proportion, prove that $(a + b + c)(a - b + c) = a^2 + b^2 + c^2$.
4. If $(x - 9) : (3x + 6)$ is the duplicate ratio of 4 : 9, find the value of x .
5. If $\frac{3x+5y}{3x-5y} = \frac{7}{3}$ find $x : y$.
6. If $a : b = 4 : 5$ and $b : c = 6 : 7$, find $a : c$ and $a : b : c$.
7. If $2a^2 - 3ab + b^2 = 0$, find the ratio of $a : b$.
8. If a, b and c are in continued proportion, prove that $a : c = (a^2 + b^2) : (b^2 + c^2)$.
9. If $(a^2 + b^2)(m^2 + n^2) = (am + bn)^2$, prove that $\frac{a}{m} = \frac{b}{n}$.
10. If $x : y = y : z$, prove that $x : z = x^2 : y^2$.
11. Solve for x : $\frac{a + \sqrt{a^2 - 2ax}}{a - \sqrt{a^2 - 2ax}} = b$.
12. Solve for x : $81 \left(\frac{2a-x}{2a+x} \right)^4 = \frac{2a+x}{2a-x}$.
13. If $\frac{x}{y+z} = \frac{y}{z+x} = \frac{z}{x+y}$, show that each ratio is equal to $\frac{1}{2}$ or -1 .
14. Two numbers are in the ratio of 3 : 5. If 8 is added to each number, the ratio becomes 2 : 3. Find the numbers.
15. Find two positive numbers such that they are in the ratio of 5 : 3 and the difference of their squares is 400.

Answers

1. RHS hence, proved 2. 6 3. RHS Hence proved 4. 25 5. 25 :6
6. 24: 35; 24: 30: 35 7. 1: 1 or 1: 2 11. $\frac{2ab}{(b+a)^2}$ 12. $x = 4$ 14. 24 and 40 15. 25, 15

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