



Algebra & Operations 7th/8th

| | |
|----|--|
| 1 | If $a + b = \sqrt{245}$ and $a * b = 60$, find the value of $\frac{1}{a^2} + \frac{1}{b^2}$. |
| 2 | Let x and y be positive integers so that $65\sqrt{388} = x\sqrt{y}$. If y is smaller than x , find the value of $x + y$. |
| 3 | The product of x and $x + 2$ is equal to twice their positive difference. What is $(x + 1)^2$? |
| 4 | If $f(x) = 4x + 5$ and $g(x) = \frac{9}{x}$ what is the value of $f(g^{-1}(3))$? |
| 5 | Find the conditions on a and b such that the equation $ax^2 + (b + 1)y + x - 2 = 0$ is a straight line that is not perpendicular to the x or y axis. |
| 6 | Given $\frac{a+x+b+y+q}{5} = a + x$, express $q + y + b$ in terms of a and x . |
| 7 | The distance between the points (a, a) and (b, b) is 2. If b is greater than a , what is the value of $a - b$? |
| 8 | If $3y = 2x$, evaluate the expression: $\frac{(x+y)(x-y)}{(x^2+y^2)}$. |
| 9 | If x is less than 4 but greater than 3 and y less than 6 but greater than 5, What is the range of $y + \frac{4}{x}$? |
| 10 | Factor the expression: $169x^4 + 26x^2y + y^2 - z^2 - 4z - 4$. |