

Algebra test

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Problem 1.

Find all values of x and y such that $x - y = 5$ and $5x - 3y = 9$.

Problem 2.

Expand $(a - b + 2c)^2$.

Problem 3.

a) Prove that in an isosceles triangle $\triangle ABC$ with $AB = AC$ the median and the altitude out of point A coincide.

b) Prove that in an isosceles triangle $\triangle ABC$ with $AB = AC$ the median and the angle bisector out of point A coincide.

Problem 4.

a) Factor $a^2 - b^2$.

b) Factor $a^3 - b^3$.

c) Factor $a^n - b^n$ where n is a positive integer.

d) Factor $a^n + b^n$ where n is an odd positive integer.

Problem 5.

Let y, z be two different solutions to the equation $x^2 + 8x + 13 = 0$. What is the value of

$$\frac{yz}{y+z}$$