

### Answer on Question #43652 – Math – Algebra

Factor the following:

$$9x^2 - y^2 - 4z^2 + 4yz$$

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Factor  $-y^2 + 4yz + (9x^2 - 4z^2)$   
by splitting the product  $4z^2 - 9x^2$   
into two parts whose sum is  $4z$ .

The factors of  $4z^2 - 9x^2$  that sum to  $4z$  are  $y(2z - 3x)$  and  $y(3x + 2z)$ .  
So,  $-y^2 + 4yz + (9x^2 - 4z^2) = -y^2 + y(2z - 3x) + y(3x + 2z) + (3x - 2z)(3x + 2z)$ :

$$-y^2 + y(2z - 3x) + y(3x + 2z) + (3x - 2z)(3x + 2z)$$

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Factor pairs of terms in  
 $-y^2 + y(2z - 3x) + y(3x + 2z) + (3x - 2z)(3x + 2z)$   
by grouping.

$$-y^2 + y(2z - 3x) + y(3x + 2z) + (3x - 2z)(3x + 2z) = (3x + 2z)(y + (3x - 2z)) - y(y + (3x - 2z)):$$

$$(3x + 2z)(y + 3x - 2z) - y(y + 3x - 2z)$$

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Pull a common factor out of  
 $(3x + 2z)(y + 3x - 2z) - y(y + 3x - 2z)$ .

Factor  $3x + y - 2z$  out of  $(3x + 2z)(y + 3x - 2z) - y(y + 3x - 2z)$ ,  
resulting in  $(y + 3x - 2z)((3x + 2z) - y)$ :

**Answer:**

$$(y + 3x - 2z)(-y + 3x + 2z)$$