

Steps in Factoring Trinomials (Math 9)

Factor $x^2 + 7x + 12$

Step 1: Find two numbers that...

→ multiply together to give the last term and that

→ add together to give the coefficient of the middle term

| Numbers that Multiply to 12 | Sum |
|-----------------------------|--------------------|
| 1 X 12 | 1 + 12 = 13 |
| -1 X -12 | (-1) + (-12) = -13 |
| 2 X 6 | 2 + 6 = 8 |
| -2 X -6 | (-2) + (-6) = -8 |
| 3 X 4 | 3 + 4 = 7 ← |

3 and 4 are the "KEYS" to Factoring $x^2 + 7x + 12$

Step 2: Write the middle term as the sum of the "KEYS"

$$x^2 + 7x + 12 = x^2 + 3x + 4x + 12$$

Step 3: Group the first two terms and the last two terms together

$$(x^2 + 3x) + (4x + 12)$$

Step 4: Factor out the GREATEST Common Factor from each group

$$x(x + 3) + 4(x + 3)$$

Step 5: Factor out the Common Factor and group the rest of the numbers together

$$x(x + 3) + 4(x + 3) = (x + 3)(x + 4)$$

Step 6: Check by Expanding

$$(x + 3)(x + 4) =$$

Final Answer: _____