

Which is better?

Alex and Morgan were asked to factor  $4x^2 + 18x + 14$

Alex's "factor by splitting the middle term first" way

Morgan's "factor out a common factor first" way

First I needed to find two numbers whose product equaled 56 ( $4 \times 14$ ) and whose sum equaled 18.

I made a table of possible factor pairs for 56, and checked to see which pair added up to 18.

4 plus 14 equals 18, so I chose that pair.

I rewrote the original equation with  $(14x + 4x)$  as my new middle term.

I grouped the terms.

I factored a  $2x$  from the first parentheses and a 2 from the second parentheses.

I simplified the expression.

I factored out a 2 from the first parentheses. Here is my answer.

$$ax^2 + bx + c$$

$$4x^2 + 18x + 14$$

$$4 \cdot 14 = 56$$

Factors of 56	Sum of Factors
1, 56	$1 + 56 = 57$
2, 28	$2 + 28 = 30$
4, 14	$4 + 14 = 18$

$$4x^2 + 14x + 4x + 14$$

$$(4x^2 + 14x) + (4x + 14)$$

$$2x(2x + 7) + 2(2x + 7)$$

$$(2x + 2)(2x + 7)$$

$$2(x + 1)(2x + 7)$$



$$4x^2 + 18x + 14$$

$$2(2x^2 + 9x + 7)$$

Factors of 14	Sum of Factors
1, 14	$1 + 14 = 15$
2, 7	$2 + 7 = 9$

$$2(2x^2 + 7x + 2x + 7)$$

$$2[(x)(2x + 7) + (2x + 7)]$$

$$2(x + 1)(2x + 7)$$



First I factored out a 2 from the expression.

I made a table of possible factor pairs for 14 ( $2 \times 7$ ), and checked to see which pair added up to 9 (the new middle term).

2 plus 7 equals 9, so I chose that pair.

I rewrote the original equation with  $(7x + 2x)$  as my new middle term.

I factored out an  $x$  from the first parentheses.

I simplified the resulting expression. Here is my answer.

- \* How did Alex factor the expression? How did Morgan factor the expression?
- \* What are some similarities and differences between Alex's and Morgan's ways?
- \* On a timed test, would you rather do Alex's way or Morgan's way? Why?