

Factor by Grouping Guided Lesson Explanation

Problem #1 Explanation

1) $ab + 5a + cb + 5c$

Step 1) Look for common factors between all four terms. There is no common factor between all the terms.

Step 2) Split the four terms into two groups. This expression would appear as:

$$ab + 5a \mid + cb + 5c$$

Step 3) Consider each side of the expression and identify any common terms. The GCF of the left side is (a). The GCF of the right side is (c). We will rewrite this expression as:

$$a(b + 5) \mid c(b + 5)$$

Step 4) Look to further simplify. We can see that what is in the parenthesis is a perfect math $(b + 5)$, so we can factor that out as well. We are left with:

$$(b + 5)(a + c).$$

Problem #2 Explanation

$$c^2 + 4cm - cx + 4xm$$

Step 1) Look for common factors between all four terms. There is no common factor between all the terms.

Step 2) Split the four terms into two groups. This expression would appear as:

$$c^2 + 4cm \mid - cx + 4xm$$

Step 3) Consider each side of the expression and identify any common terms. The GCF of the left side is (c). The GCF of the right side is (x). We will rewrite this expression as:

$$c(c + 4m) - x(c + 4m)$$



Step 4) Look to further simplify. We can see that what is in the parenthesis is a perfect math $(c + 4m)$, so we can factor that out as well. We are left with:

$$(c + 4m)(c - x)$$

Problem #3 Explanation

$$2f^2 + 8f - 2fx - 8x$$

Step 1) Look for common factors between all four terms. 2 is the common factor between all the terms. When we factor out 2, we are left with:

$$2(f^2 + 4f - fx - 4x)$$

Step 2) Now that we have removed the common factor, we will split the four terms into two groups. This expression would appear as:

$$2(f^2 + 4f \quad | \quad -fx - 4x)$$

The GCF of the left side is (f) . The GCF of the right side is (x) . We will rewrite this expression as:

$$2(f(f + 4) - x(f - 4))$$

Step 3) We can simplify operations taken place in the expression:

$$2(f(f + 4) - x(f - 4)) \quad \text{to:} \quad 2(f(f + 4) - x(f + 4))$$

Step 4) Look to further simplify. We can see that what is in the parenthesis is a perfect math $(f + 4)$, so we can factor that out as well. We are left with:

$$2((f + 4)(f - x))$$

