

7.5 Part 2 Factoring Linear Expressions

We've learned to use the distributive property to **multiply a monomial and a polynomial**.

Now we will work backwards to put polynomials in **factored form**.

Example 1: Use the distributive property to factor $3x + 9$.

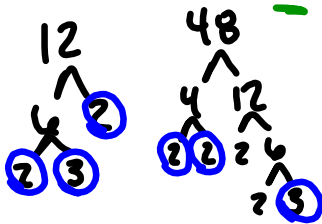
$$\text{GCF of } 3 \text{ \& } 9 = 3$$

$$3(x + 3)$$

Example 2: Use the distributive property to factor

$$12x + 48.$$

$$\text{GCF of } 12 \text{ \& } 48: 12$$



$$2 \cdot 2 \cdot 3 = 12$$

$$12(x + 4)$$

Example 3: Use the distributive property to factor

$$3x + 11.$$

$$\text{GCF of } 3 \text{ \& } 11: 1$$

$$3x + 11$$

Example 4: Use the distributive property to factor $4x + 28$. 2 GCF of 4 & 28: 4

$$4(1x + 7)$$

Example 5: Use the distributive property to factor $3 + 33x$. 3 GCF of 3 & 33: 3

$$3(1 + 11x)$$

Example 6: Use the distributive property to factor

$18x^2 - 12x^3$. 2 GCF: $6x^2$

$\begin{array}{r} 18 \\ \swarrow \searrow \\ 9 \quad 2 \\ \swarrow \searrow \\ 3 \quad 3 \end{array}$
 $\begin{array}{r} 12 \\ \swarrow \searrow \\ 6 \quad 2 \\ \swarrow \searrow \\ 2 \quad 3 \end{array}$

 $2 \cdot 3 = 6$

$$6x^2(3 - 2x)$$

Example 7: Use the distributive property to factor

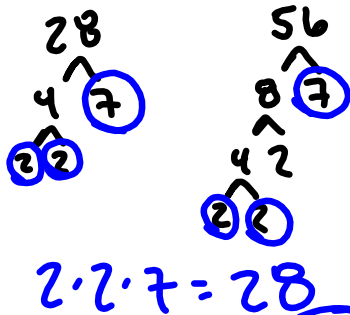
$28a^4 - 42a^2$. 2 GCF: $14a^2$

$\begin{array}{r} 28 \\ \swarrow \searrow \\ 7 \quad 4 \\ \quad \swarrow \searrow \\ \quad 2 \quad 2 \end{array}$
 $\begin{array}{r} 42 \\ \swarrow \searrow \\ 7 \quad 6 \\ \quad \swarrow \searrow \\ \quad 3 \quad 2 \end{array}$

 $7 \cdot 2 = 14$

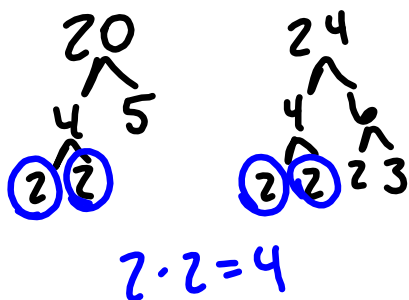
$$14a^2(2a^2 - 3)$$

Example 8: Factor $28ab + 56abc^2$. $\text{GCF: } 28ab$



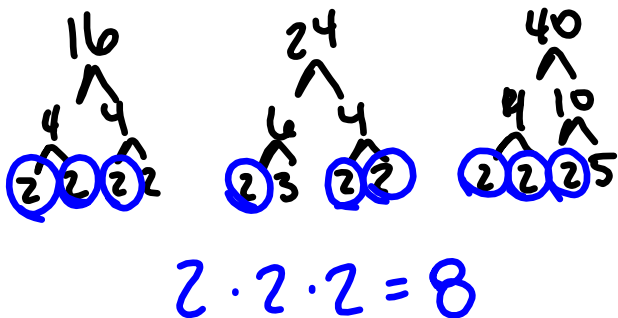
$$28ab(a + 2c^2)$$

Example 9: Factor $20xy - 24xy^3$. $\text{GCF: } 4x^2y$



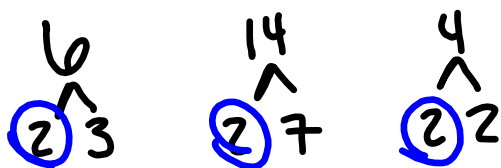
$$4x^2y(5x - 6y^2)$$

Example 10: Factor $16g^2 - 24g^2h + 40g^2$. $\text{GCF: } 8g^2$



$$8g^2(2f - 3h + 5)$$

Example 11: Factor $6k^3m + 14k^2m^2 - 4k^3m^3$. $\text{GCF: } 2k^2m$



$$2k^2m(3k + 7m - 2km^2)$$