

## Common Factoring

Factoring is the opposite of the distributive property. The greatest common factor (**GCF**) for a polynomial is the largest monomial that you can divide out of each term in the polynomial.

| Steps:   | Ex 1: $6x^2 - 8x$ | Ex 2: $9x^2y^2 + 6xy^2 - 12x^3y^3$ |
|--|-------------------|------------------------------------|
| <b>STEP 1:</b> Look at the coefficients. Is there a GCF?   |                   |                                    |
| <b>STEP 2:</b> Look at the variables. Is there a variable that is common in every term? If so, take out the smallest exponent. |                   |                                    |
| <b>STEP 3:</b> Identify the GCF. Then, divide every term by the GCF (this is the left over that will go into the brackets).    |                   |                                    |
| <b>STEP 4:</b> Write it appropriately in factored form.  |                   |                                    |
| <b>*TO CHECK:</b> You multiply the GCF back into every term to see if it matches the original polynomial.                      |                   |                                    |

**Examples:** Factor fully.

1.  $6x + 3$

2.  $49p - 14$

3.  $3x^2 + 9x - 3$

4.  $16x^3 + 8x^2 + 4x$

5.  $20x^3y^2 + 5x^4y - 10x^2y^2$

6.  $9x^3 + 6x^5 + 12x^2$

7.  $8xy^2 + 4x^2y - 6xy^5$

8.  $3x - 6$

9.  $15x + 10y + 25$

10.  $4x - 4y + 8$

11.  $12x^2 - 6x + 9$

12.  $x^8 + x^7 + x^6 + x^5$

13.  $5x^5 - 4x^4 + 3x^3$

14.  $x^3 + x^2$

15.  $6x^5 + 2x^3$

16.  $2x^3 - 4x^2 + x$

17.  $3x^6 - 2x^5 + 4x^4 - 6x^2$

18.  $16x^5 - 32x^4 + 24x^3$

19.  $36y^{15} - 27y^{10} - 18y^5$

20.  $8z^2 - 12z + 20$

21.  $16x^2 - 24x + 40$

22.  $20x^4 - 12x^3 + 36x^2 - 4x$

23.  $18x^8 - 81x^6 + 27x^4 - 45x^2$

24.  $12x^{10} - 6x^3 + 3$

25.  $3abc - 4ab$

26.  $2xy - 8xyz$

27.  $x^2y^3 - x^3y^2$

28.  $8ab^3 + 12a^2b^2$

29.  $a^5b^5 - a^8b^2$

30.  $x^6yz^2 + x^2y^4z^3 - x^3y^3z^4$