Factoring a Difference of Squares

Task 1: How to Factor a DOS

Go to
bit.ly/howtofactorDOS

- Complete the activity by following the instructions.
- Complete the blanks in the box below as you progress through the activity.
- When you are told to "Grab some paper and a pencil and factor the following problems", complete the work below BEFORE you click to get the answer. Use the website to check your answers, NOT copy them down.

Difference of Squares

- A **perfect square** is the result of multiplying a number by itself
  - *EG:* 9 x 9 = 81
    4 x 4 = 16
- Variables can also be perfect squares. A variable raised to an ever power is a perfect square.
  - *EG:* x^8
    y^16

Recall: To factor a polynomial is to write the polynomial as the product of two or more polynomials.

In order to factor using the ***difference of two perfect squares***, three conditions must be met. The conditions are:

1. you have two expressions
2. joined by a subtraction sign
3. both expressions are perfect squares

EG:

Formula: $x^2 - c^2 = (x + c)(x - c)$

- Square root each term
- In one bracket put a +, in the other bracket put a –.

- NOTE: Not all of the expressions can be factored, because not all of them are a difference of squares. If they're not possible, please write 'NP', and explain why not.

1. $x^2 - 64$

   $= (x-8)(x+8)$

2. $x^2 - 10$

   $=$ NP because 10 is not perfect square

3. $4x^2 - 25$

   $= (2x-5)(2x+5)$

4. $x^4 - 1$

   $= (x^2-1)(x^2+1)$

   $=$

5. $x^8 + 16$

   $=$ NP b/c it's not difference of squares, but sum

6. $x^{12} - y^8$

   $= (x^6 - y^4)(x^6+y^4)$

   $= (x^3-y^2)(x^3+y^2)(x^6+y^4)$

Task 2: More Practice

- Log off your laptop now.

Factor each expression. If not possible, please write 'NP', and explain why not.

7. $4x^2 - 9$

   $= (2x-3)(2x+3)$

8. $x^2 - 49y^2$

   $= (x-7y)(x+7y)$

9. $9x^2 - 1$

   $= (3x-1)(3x+1)$

10. $4x^2 + 81$

    $=$ NP, b/c it's not DOS

11. $16x^2 - 3$

    $=$ NP b/c it's not DOS

12. $x^4 - 25$

    $= (x^2-5)(x^2+5)$

13. $2x^2y - 18y$

    $= 2y(x^2-9)$

    $= 2y(x-3)(x+3)$

14. $x^4 - 16$

    $= (x^2-4)(x^2+4)$

    $= (x-2)(x+2)(x^2+4)$