Difference of two Squares

Factors – these are smaller things (usually) inside a bigger thing that

    1) **multiply** by another smaller thing to give the bigger thing

        It should be noted that factors occurs in pairs and it is when a factor is multiplied by its partner factor that it gives the bigger thing

and 2) **divide evenly** (without a remainder) into the bigger thing

    For example 6 has the factors 6 & 1 and 2 & 3

        Each of these smaller things divide evenly into the bigger thing (into 6)

        so $\frac{6}{6} = 1$ or $\frac{6}{1} = 2$ or $\frac{6}{2} = 3$ or $\frac{6}{3} = 2$

        Also taking them in pairs these factors will multiply to give the bigger thing

        so 2 x 3 = 6   and   6 x 1 = 6

Just like numbers algebraic expressions (expressions in maths which have letters in them) also have factors inside them.

    For example   6x + 2   has the factors
                         2 and (3x + 1)

                         Both of these will multiply by each other to give 6x + 2

                         They will also divide into each other (the method to do this is only part of the honours leaving cert course and won't be shown here)

Difference of two squares

Use this when you have **two terms** which are **subtracting from each other**

It involves the formula

$$a^2 - b^2 = (a + b)(a - b)$$

eg factorise $64x^2$ - 1

    Step 1) check whether this method applies (ie do you have two terms and are they subtracting from each other?)

    Step 2) find the square root of each of the terms and label each as either 'a' or 'b'

        $\sqrt{64x^2} = 8x$ →   this is our 'a'

     and $\sqrt{1} = 1$ →   this is our 'b'

Step 3) write out the difference of two squares formula and slot in your 'a' everywhere you see 'a' in the formula and repeat for 'b'

$$a^2 - b^2 = (a + b)(a - b)$$

$$(8X + 1)(8X - 1)$$

So the factors of $64x^2 - 1$ are $(8X + 1)$ and $(8X - 1)$

We could check this by seeing if the two factors multiply together to give $64x^2 - 1$
(remember as we said earlier two factors will multiply together to give the bigger thing)

$$(8X + 1)(8X - 1)$$

$\rightarrow$ $8x(8X - 1) + 1(8X - 1)$

$\rightarrow$ $64x^2 - 8x + 8x - 1$

$\rightarrow$ $64x^2 - 1$