**Worksheet - FACTORING**

**Definition:**

1. Determine if the following expressions are sums or products, and make the list of their factors or terms.

a) $5x^{3}-3x^{2}+1$

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

c) $\left(x-5\right)(2x+1)^{2}$

d) $3x\left(x+5\right)-6$

e) $(x-3)^{2}+5(x-3)$
2. Expand the following expressions :

a) $5x\left(x-3\right)=$

b) $\left(x+2\right)\left(3x-5\right)=$

c) $(3x-2)^{2}=$

d) $(x+1)^{2}-5\left(x-3\right)=$

e) $\left(x-1\right)\left(x+2\right)-\left(x-3\right)\left(x+4\right)=$

f) $\left(x+2\right)\left(2x-3\right)\left(3x+4\right)=$

**Factoring by common factor:**

1. Factor the following expressions

a) $5x^{2}-25x=$

b) $21x^{2}-14x+28=$

c) $\left(x-3\right)\left(2x+1\right)-3\left(2x+1\right)=$

d) $(x-5)^{2}-\left(x-5\right)\left(2x+1\right)=$

**Factoring trinomials of the form** $ax^{2}+bx+c$**:**

1. Factor the following expressions :
a) $x^{2}-2x-3=$

b) $3x^{2}+5x-2= $

c) $x^{2}+5x+4=$

d) $2x^{2}+7x-15=$

e) $x^{2}-5x-6=$

f) $6x^{2}+x-2=$

g) $5x^{2}+5x-60=$

**Factoring Special polynomials:**

1. Factor the following expressions :

a) $x^{2}-16=$

b) $25x^{2}-1=$

c) $x^{2}-6x+9=$

d) $4x^{2}+4x+1=$

e) $2x^{2}-72=$

f) $3x^{2}-6x+3=$

g) $\frac{1}{4}x^{2}+\frac{1}{2}x-6=$

h) $0.1x^{2}-0.1x-3=$

i) $\frac{1}{25}x^{2}-\frac{1}{49}y^{2}=$

j) $0.81x^{2}-0.25=$

**Other techniques:**

1. Factor the following expressions :

a) $4(x+3)^{2}+8\left(x+3\right)-5=$

b) $9(x-1)^{2}-100(x+1)^{2}$

c) $(2x-1)^{2}+16\left(2x-1\right)+63=$

d) $25\left(x^{2}-9\right)^{2}-16\left(x-3\right)^{2}=$

Hwk : p 229 # 5, 6

**Mix Mix :**

1. Factor the following expressions:
2. $14x^{3}y^{2}-21z^{3}x^{2}$
3. $x^{2}+8x+12$
4. $2x^{2}+5x+2$
5. $3x^{2}+24x+45$
6. $8x^{2}-14x+6$
7. $81-4x^{2}$
8. $x^{2}+10x+25$
9. $\frac{9x^{2}}{16}-\frac{100y^{2}}{81}$
10. $(x-6)^{2}+10\left(x-6\right)+9$
11. $-8x^{3}+20x^{2}-4x$
12. $x^{2}+7x+10$
13. $7x^{2}+8x+1$
14. $5x^{2}-15x-20$
15. $-18x^{2}+39x+15$
16. $18x^{2}-2y^{2}$
17. $16-40x+25x^{2}$
18. $(x+5)^{2}-49(x-9)^{2}$
19. $4(5x-1)^{2}-12\left(5x-1\right)+5$