4.5 Mulitplying & Factoring with GCF

How do you multiply 3 numbers together?



A. Multiplying 3 Factors Together

1.
$$4(2x-3)(w-3y)$$

$$= (8x-12)(w-3y)$$

$$= 8xw-24xy-12w+36y$$

$$= (8x-12)(w-3y)$$

$$= 8xw-34xy-12w+36y$$

3.
$$-2(x+3)(x-5)$$

$$= (-2x-6)(x-5)$$

$$= -2x^2 + 10x - 6x + 30$$

$$= -2x^2 + 4x + 30$$

2.
$$-3x(a-b)(3c+2d) = (-3ax+3bx)(3c+2d)$$

$$= -9acx+9bcx-6adx+6bdx$$

	-3a~	3bx
3c	- 9acx	9 bc x
22	-6adx	6 bdx

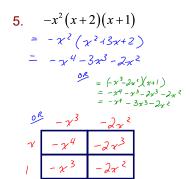
4.
$$5(x-4)(x-6)$$

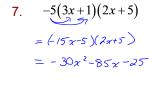
$$= (5x-20)(x-6)$$

$$= 5x^{2} - 30x - 20x + 120$$

$$= 5x^{2} - 50x + 120$$







	-15x	-5
27	-30x2	-102
5	-75x	-25



6.
$$3(2x-1)(3x+4)$$

= $3(6x^2+5x-4)$
= $(8x^2+15x-12)$

 $\begin{array}{c|cccc}
(6x-3)(3x+4) \\
6x & -3 \\
3y & |8x^2 & -9x \\
4 & 24y & -/2 \\
& = |8x^2+|5x-|2|
\end{array}$

8.
$$4x(3x-4)(2x-3)$$

$$= \frac{1}{x}(6x^{2}-17x+12)$$

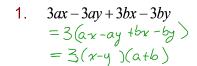
$$= \frac{3}{x}$$

$$-4$$

$$\sqrt{6x^{2}-8x}$$

Look for **GCF** first!!!

Factoring with a GCF (Greatest Common Factor)



	×	- g
0	Qγ	-ay
6	bχ	-by

3.
$$5x^2 - 5x - 60$$

= $5(x^2 - x - 12)$
= $5(x + 3)(x - 4)$

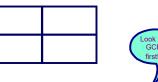
۷.	$-12x^{2}y - 8x^{2} + 6xy + 4x$
	$=-2x\left(bxy+4x-3y-2\right)$
	=-2x(3y+2)(2x-1)
	2

	3y	2
2x	6xy	4x
- (-3y	-2

4.
$$-2x^{2}y + 10xy - 12y$$

$$= -2y(x^{2} - 5x + 6)$$

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





	X	- 2
X	γ²	-2x
-3	-3x	6

$$M = 6$$
 $A = -5$
 $N = -2, -3$

5.
$$24x^2 + 52x + 20$$

= $4(6x^2 + 13x + 5)$
= $4(2x+1)(3x+5)$

6.
$$6x^{3} + 27x^{2} - 15x$$

$$= 3x (2x^{2} + 9x - 5)$$

$$= 3x (x + 5)(2x - 1)$$

$$3x$$
 5 M 30
 $2x$ $6x^2$ $10x$ A 13
1 $3x$ 5 N 10_1 3

7.
$$6x^{4} + 2x^{3} - 4x^{2}$$

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

$$= 2x^{2} (x + 1) (3x - 2)$$

8.
$$3x^{3}y+6x^{2}y+24xy$$

$$= 3xy(x^{2}+2x+8)$$

$$= 3xy(\dots ???$$

$$NOT$$

$$EACTORABLE$$



	×	1	M	-6
3×	3x2	3x	A	1
- 2	-2 _x	-2	Λ	3, -2

