

Multiply the following
binomials:

$$(x + 2)(x + 3)$$

$$x^2 + 3x + 2x + 6$$

$$x^2 + 5x + 6$$

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

$$x^2 + 4x + 4x + 16$$

$$x^2 + 8x + 16$$

$$(x + 5)(x - 6)$$

$$x^2 - 6x + 5x - 30$$

$$x^2 - x - 30$$

$$(x - 2)(x + 2)$$

$$x^2 + 2x - 2x - 4$$

$$x^2 - 4$$

FACTORIZING

trinomials

$= a = 1$

$= a \neq 1$

G.C.F.

Special Products

- perfect sq.

- difference
of
squares

- sum of
squares

Greatest Common Factor (GCF)

factor - one of two whole numbers that when multiplied together result in a product

Find the factors of 15:

$$\begin{array}{l} 1 \times 15 \\ 3 \times 5 \end{array}$$

1, 3, 5, 15

How do you find the Greatest Common Factor (GCF) of 32 and 60?

$$\text{Factors of 32} = \{ \underline{1}, \underline{2}, \underline{4}, 8, 16, 32 \}$$

$$\text{Factors of 60} = \left\{ \begin{array}{l} 1, 2, 3, \underline{4}, 5, 6, 10, 12, \\ - \underline{15}, 20, 30, 60 \end{array} \right\}$$

Which factors do 32 and 60 have in common?

The set of common factors
for 32 and 60 is $\{ 1, 2, 4 \}$.

The Greatest Common Factor (GCF) for 32
and 60 is 4.

Factor: $32x + 60$ using the GCF (4)

$$\begin{array}{c} \underline{4} \quad \Downarrow \\ \Downarrow \\ 4(8x + 15) \end{array}$$



Factor $\frac{32x^2}{4x} + \frac{60x}{4x}$ using the GCF: $(4x)$

$$4x (8x + 15)$$

How do you find the Greatest Common Factor (GCF) of 12 and 30?

6

$$12 : \begin{array}{l} 1 \times 12 \\ 2 \times \boxed{6} \\ 3 \times 4 \end{array}$$

$$30 : \begin{array}{l} 1 \times 30 \\ 2 \times 15 \\ 3 \times 10 \\ 5 \times \boxed{6} \end{array}$$

Factor: $12x + 30$ using the GCF $\textcircled{6}$

$$6(2x + 5)$$

Factor $\frac{12x^4}{12x^3} + \frac{60x^3}{12x^3}$ using the GCF:

$$12x^3(x + 5)$$

12	GCF 12
60	
x^4	x^3
x^3	

Try these:

$$\frac{-2x}{2} + \frac{10}{2} \quad \text{GCF (2)} = 2(-x + 5)$$

$$10x^4 + 6x^3 - 10 \quad \text{GCF (2)} = 2(5x^4 + 3x^3 - 5)$$

$$\frac{8a^4}{8a^2} + \frac{40a^3}{8a^2} - \frac{8a^2}{8a^2} \quad \text{GCF } 8a^2 = 8a^2(a^2 + 5a - 1)$$

Factoring Trinomials:

Do you see a pattern????

1)

2)

3)

4)

Try these...

5)

$2 \times \underline{3}$	
\diagdown	\diagup
6	
<u>2</u>	<u>3</u>
\diagup	\diagdown
5	
$2 + \underline{9}$	

6)

1×8	
\diagdown	\diagup
8	
1	8
\diagup	\diagdown
9	
$1 + 8$	

7)

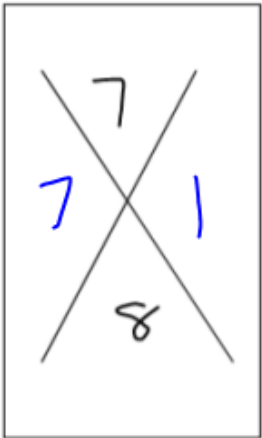
$7 \times \underline{4}$	
\diagdown	\diagup
28	
7	4
\diagup	\diagdown
11	
$7 + \underline{4}$	

8)

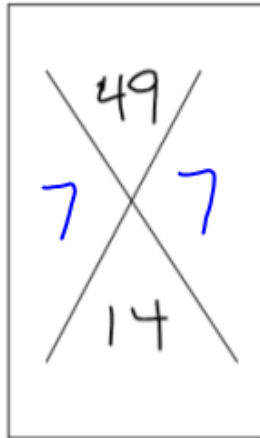
$-7 \times \underline{-4}$	
\diagdown	\diagup
28	
-7	-4
\diagup	\diagdown
-11	
$-7 + \underline{-4}$	

Try these...

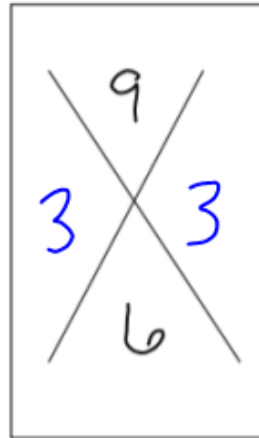
9)



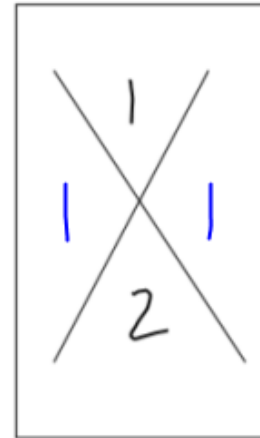
10)



11)



12)



13)

$$\begin{array}{c} 45 \\ \diagdown \quad \diagup \\ \diagup \quad \diagdown \\ -14 \end{array}$$

14)

$$\begin{array}{c} 36 \\ \diagdown \quad \diagup \\ \diagup \quad \diagdown \\ 12 \end{array}$$

15)

$$\begin{array}{c} 4 \\ \diagdown \quad \diagup \\ \diagup \quad \diagdown \\ -5 \end{array}$$

16)

$$\begin{array}{c} 15 \\ \diagdown \quad \diagup \\ \diagup \quad \diagdown \\ -8 \end{array}$$

17)

$$\begin{array}{c} -15 \\ \diagdown \quad \diagup \\ \diagup \quad \diagdown \\ -2 \end{array}$$

18)

$$\begin{array}{c} -15 \\ \diagdown \quad \diagup \\ \diagup \quad \diagdown \\ 2 \end{array}$$

19)

$$\begin{array}{c} -28 \\ \diagdown \quad \diagup \\ \diagup \quad \diagdown \\ -3 \end{array}$$

20)

$$\begin{array}{c} -42 \\ \diagdown \quad \diagup \\ \diagup \quad \diagdown \\ -1 \end{array}$$

$$x^2 + 8x + 15 \quad \text{Check}$$

$$\begin{array}{ccc} & 15 & \\ 5 & \times & 3 \\ & 8 & \end{array}$$

$$(x+5)(x+3)$$

$$x^2 + 5x + 6 \quad \text{Check}$$

$$\begin{array}{ccc} & 6 & \\ 3 & \times & 2 \\ & 5 & \end{array}$$

$$(x+3)(x+2)$$

$$\begin{array}{l} 5, 1 \\ 3, 2 \end{array}$$

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

$$\begin{array}{l} x^2 \\ \times \\ + 8x + 15 \end{array}$$

$$z^2 - 8z + 7$$

Check

$$\begin{array}{ccc} & 7 & \\ -7 & \times & -1 \\ & -8 & \\ & \text{add} & \end{array}$$

$$(z - 7)(z - 1)$$

$$x^2 - 2x - 15$$

Check

$$\begin{array}{ccc} & -15 & \\ -5 & \times & 3 \\ & -2 & \end{array}$$

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

$$\underline{c}^2 - 7\underline{c} + 10 \quad \text{Check}$$

$$\begin{array}{ccc} & 10 & \\ -5 & \times & -2 \\ & -7 & \end{array}$$

$$(c-5)(c-2)$$

$$a^2 + 11a + 30 \quad \text{Check}$$

$$\begin{array}{ccc} & 30 & \\ 5 & \times & 6 \\ & 11 & \end{array}$$

$$(a+5)(a+6)$$

	Trinomial	X-Factor	Factored Form	Check your Work!!!
1	$x^2 + 5x + 6$			
2	$x^2 + 6x + 8$			
3	$x^2 - 12x + 20$			

4	$x^2 - 9x + 14$			
5	$x^2 + 5x - 6$			
6	$x^2 - 9x - 36$			
7	$x^2 + 7x - 8$			

8	$x^2 - x - 20$			
9	$x^2 - 6x - 27$			
10	$x^2 - 2x - 48$			
11	$x^2 + 11x - 12$			

Homework #13

Factoring Trinomials