

Mucc. Jan 29

Factor out a constant before factoring.

$$\frac{5V^2}{5} + \frac{30V}{5} + \frac{70}{5}$$

$$5(V^2 + 6V + 14)$$

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$$5(V \quad)(V \quad)$$

$$\begin{array}{r|l} 14 & 6 \\ \hline 1 \cdot 14 & \\ 2 \cdot 7 & \end{array}$$

because cannot be factored any further!  
☺

$$\frac{3u^2}{3} + \frac{12u}{3} - \frac{63}{3}$$

$$3(u^2 + 4u - 21)$$

$$3(u - 3)(u + 7)$$

$$\begin{array}{r|l} L & m \\ \hline -21 & 4 \\ \hline -3 \cdot 7 & \end{array}$$

$$\underline{6x^2} - \underline{48x} + \underline{72}$$

$$6(x^2 - 8x + 12)$$

$$6(x-6)(x-2)$$

$$\begin{array}{r|l} 12 & -8 \\ \hline & \end{array}$$

- 1 · 12
- 2 · 6
- 3 · 4

$$-6 \cdot 2$$

# What is factoring?

Is a series of techniques to solve equation & Quadratic.

Ex:  $3x + 12$

Factoring comes from factors.

Ex  $4 \times 3 = 12$   
          ↑      ↑      (Product)  
          Factor factor

Expression  $\frac{3x}{3} + \frac{12}{3}$

To factor this expression you need GCF

$3(x+4)$  factored!

Techniques:

1. Regular factorization
2. Factoring by Grouping (AC method)
3. Factoring by Completing the Square
4. Factoring Trial & Error
5. Quadratic formula

Example:

a)  $x^2 + 4x - 21$

*(Handwritten annotations: '2' above the x, 'm BUS' above the +4x, 'L' above the -21)*

factor Completely!

$(x-3)(x+7)$

L	m
-21	4
-3 · 7	-3 + 7 = 4

What about if it says Solve!

a)  $x^2 - 16xy + 39y^2$

*(Handwritten annotations: '2' above the x, 'm' above the -16xy, '2' above the 39y^2)*

39	-16
-3 · 13	

$\frac{x^2}{x} - \frac{3xy}{x} - \frac{13xy}{-13y} + \frac{39y^2}{-13y}$

$x(x-3y) - 13y(x-3y)$

*(Handwritten note: 'get' next to the first term)*

$(x-13y)(x-3y)$

*(Handwritten notes: 'outside' under the first term, 'Twins' under the second term)*

$$x^2 - 3xy - 4y^2$$

$a$  is circled around the coefficient of  $x^2$  (1).  
 $m$  is written above the coefficient of  $xy$  (-3).  
 $c$  is circled around the constant term (-4).

-4	-3
-1, -4	1 + (-4)

A green cloud contains the numbers -1, -4 and the expression 1 + (-4). An arrow points from the -3 in the table to the cloud.

$\frac{x^2}{x} + \frac{1xy}{x} - \frac{4xy}{-4y} - \frac{4y^2}{-4y}$	$\frac{x^2}{x} + \frac{1xy}{x} - \frac{4xy}{-4y} - \frac{4y^2}{-4y}$
$x(x+y)$	$-4y(x+y)$

$(x - 4y)$ outside	$(x + y)$ twin
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# Factor!!

a)  $1x^2 + 11xy + 30y^2$

ac m  
30 | 11  
5 · 6

Rewrite

$$\frac{x^2}{x} + \frac{5xy}{x} + \frac{6xy}{6y} + \frac{30y^2}{6y}$$

$$x(x+5y)$$

$$6y(x+5y)$$

$$(x+6y)(x+5y)$$

$$Z^2 + 9Z + 20$$

$$u(x) = \sqrt{-5x + 20}$$

Find Domain

Write in Int. Notation!

$$(-\infty, 4] \quad \checkmark$$

$$Z^2 + 9Z + 20$$

$$(Z+4)(Z+5) \quad \checkmark$$

Factor

a)  $x^2 - 3x - 4$

$(x+1)(x-4)$

$-4 \quad -3$

$-4$

Done!

Factor

b)  $7x^2 + 35x + 42$

$7(x^2 + 5x + 6)$

$7(x+3)(x+2)$

Done!

c)  $x^2 + 11xy + 30y^2$



$$7(w-3) - 5w(w-3)$$

$$(7 - 5w)(w - 3) \checkmark$$

outside

twice

$$\text{Coefficient} = 1, -5$$

$$\text{Constant} = 7, -3$$

$$\text{Binomial} = 2$$

$$(w - 3)$$

$$\text{Monomial} = 1 \quad -5w$$