

Warm-Up

April 29, 2019

1. Factor $5x^2y - 65xy^3 + 200xy$

$$\begin{array}{ccc} 5xy & 5xy & 5xy \\ \hline 5xy(x - 13y^2 + 40) \end{array}$$

2. Which is a binomial factor of $(6x^2 + 3x - 14x - 7)$

- a. $(6x - 1)$ b. $(2x - 7)$ c. $(3x + 1)$ d. $(3x - 7)$

$$\begin{array}{ccc} (6x^2 + 3x) & (-14x - 7) & \\ \hline 3x & 3x & \begin{array}{cc} -7 & -7 \end{array} \end{array}$$

$$\begin{array}{cc} (3x)(2x+1) & (-7)(2x+1) \end{array}$$

$$(3x-7)(2x+1)$$

3. Clara collects dimes and nickels. She has a total of 47 coins. She counted the value of nickels and dimes and found out she has \$4.05. How many nickels, n, does Clara have?

$n = \text{nickels}$ $d + n = 47$
 $d = \text{dimes}$ $.10d + .05n = 4.05$

$$\begin{array}{r} (-) .10d + .10n = 4.70 \\ .10d + .05n = 4.05 \end{array}$$

$$\begin{array}{r} .05n = .65 \\ \hline .05 \quad .05 \\ n = 13 \text{ nickels} \end{array}$$

Factoring Trinomials

$$ax^2 + bx + c$$

FACTORIZING TRINOMIALS

of the form



$$x^2 + bx + c$$

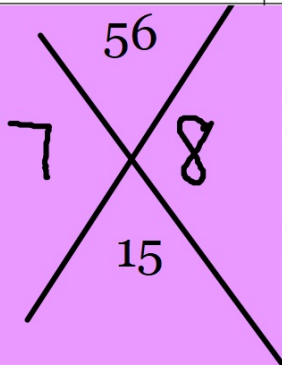
To factor a trinomial of the form $x^2 + bx + c$, you must find two integers that multiply to equal c and add to equal b.

Guided Example: $x^2 + 7x + 12$

What two integers have a product of 12 and a sum of 7? 4 + 3

Write two binomials using these integers, then distribute to check.

$$(x+4)(x+3)$$



Top number is the product of the numbers. Bottom number is the sum.

Set 1: + and +

Ex. 1) Factor $n^2 + 9n + 20$

$$a=1 \quad b=9 \quad c=20$$

$$\left(\frac{n^2}{n} + \frac{4n}{n}\right)\left(\frac{5n}{5} + \frac{20}{5}\right)$$

$$n(n+4) + 5(n+4)$$

$$(n+5)(n+4)$$

$$\begin{array}{r|l} ac=20 & \\ \hline 1 & 20 \\ 2 & 10 \\ \hline 4 & 5 \end{array}$$

Ex. 2) $w^2 + 9w + 18$

Set 2: + and -

$$n^2 + 3n - 18$$

$a=1$ $b=3$ $c=-18$

$$ac = -18$$

-1	+18
-2	+9
-3	+6

$$\left(\frac{n^2 - 3n}{n} + \frac{6n - 18}{n}\right)$$
$$n(n-3) + 6(n-3)$$
$$(n+6)(n-3)$$

$$x^2 + 2x - 8$$

How will this impact my answer?

What is different about this problem?

Set 3: - and -

$$a^2 - 2a - 3$$

$$a=1 \quad b=-2 \quad c=-3$$

$$ac = -3$$

1	-3
-1	3

$$\frac{(a^2+a)}{a} \frac{(-3a-3)}{-3}$$

$$a(a+1) - 3(a+1)$$
$$(a+1)(a-3)$$

$$x^2 - 7x - 30$$

What is different about this problem?

How will this impact my answer?

Set 4: - and +

$$x^2 - 11x + 24$$

$$a=1 \quad b=-11 \quad c=24$$

$$ac=24$$

1	24
2	12
3	8
4	6

$$(x-3)(x-8)$$

$$x^2 - 14x + 49$$

What is different about this problem?

How will this impact my answer?

WATCH THOSE SIGNS!

+ / +

$$y^2 + 2y + 1$$
$$(y + 1)(y + 1)$$

Signs are the same!
Sign of the middle term.

- / +

$$y^2 - 2y + 1$$
$$(y - 1)(y - 1)$$

Signs are the same!
Sign of the middle term.

- / -

$$n^2 - n - 90$$
$$(n - 10)(n + 9)$$

Signs are different!
Biggest factor takes the
sign of the middle term.

+ / -

$$m^2 + 5m - 6$$
$$(m + 6)(m - 1)$$

Signs are different!
Biggest factor takes the
sign of the middle term.

What if there is a GCF to factor?



$$\frac{4k^2+12k+8}{4 \quad 4 \quad 4}$$

$$4(k^2+3k+2)$$

$$a=1 \quad b=3 \quad c=2$$

$$ac=2$$

1	2
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$$4(k+1)(k+2)$$

$$\frac{2x^2-8x-24}{2 \quad 2 \quad 2}$$

$$2(x^2-4x-12)$$

$$a=1 \quad b=-4 \quad c=-12$$

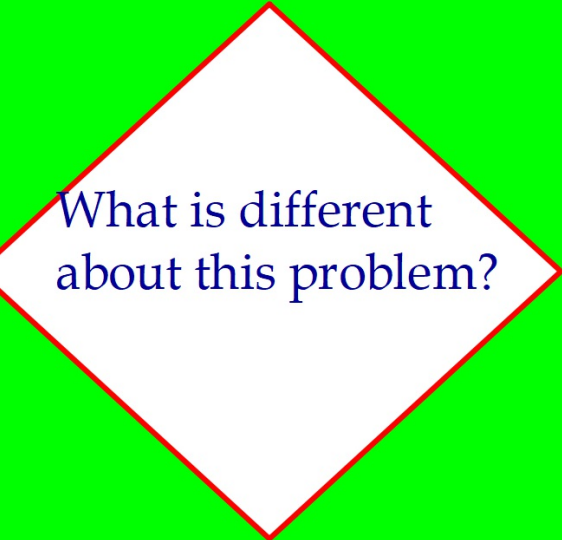
$$ac=-12$$

1	-12
2	-6
3	-4

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

Factor each polynomial. Check your answer by distributing.

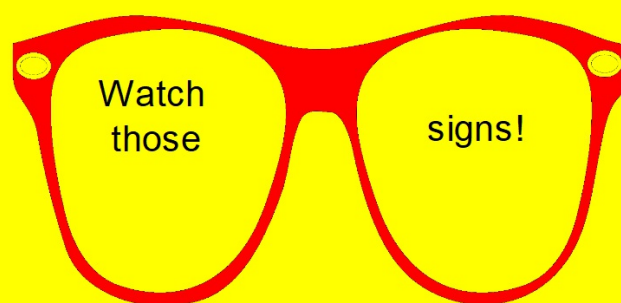
1.) $2x^2 + 5x + 2$



What is different about this problem?

$$2.) 3n^2 + 5n + 2$$

$$3.) 2y^2 + 9y - 5$$



What if there is a GCF?

10. $8x^2 - 2x - 10$

12. $60x^2 + 4x - 8$