

Put your puzzle in the Blue Bin when you're finished

Name: _____ Pd: _____

Why did the parabolic plants die?

Directions: Complete each factoring problem below. Find your answer in the Answer Key and record the corresponding letter in the blanks below to answer the riddle!

Riddle Response:

14 17 4 18 11 16 8 10 2 20 9 19 6 13 3 15 5 7 21 12 1

S

i.

	$7x$	1
$3x$	$21x^2$	$3x$
4	$28x$	4

ii.

	3	4
x	$5x^2$	$4x$
-2	$-10x$	-8

iii.

	$2x$	3
x	$2x^2$	$-3x$
3	$-12x$	8

iv.

	3	1
3	$4x^2$	$1x$
1	$4x$	1

v.

	3	2
$-4x$	$8x^2$	$6x$
3	$-6x$	4

vi.

	13	8
$6x$	$-6x^2$	$30x$
11	$5x$	-25

vii.

	15	-1
14	$24x^2$	$-8x$
15	$-6x$	11

viii.

	20	21
19	$12x^2$	$8x$
19	$18x$	12

COMPLETE THE SQUARE

Standard Form

$$y = ax^2 + bx + c$$

FACTORING

- multiply $(x-h)(x-h)$
- distribute a
- combine with k

Vertex Form

$$y = a \cdot (x-h)^2 + k$$

Reflection (-) Stretch/Comp.	Translation left/right (opposite)	translate up/down
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- Tells us all transformations
- Vertex is at (h,k) h is opposite
- Does NOT tell us x or y intercepts

- multiply with box method
- Combine like terms

Factored Form

$$y = (x-m)(x-n)$$

use the opposite signs	These are your x -intercepts
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- Tells us all x -intercepts $(m,0)$ $(n,0)$
 m and n have opposite signs
- $m \cdot n$ is the y -intercept $(0, mn)$
- Does NOT tell us transformations

Complete the Square

$$y = ax^2 + bx + c$$

Step 1

$$\boxed{\frac{1}{2}b}$$

$$y = (x + \underline{\quad})^2 + \underline{\quad}$$

Step 2

$$\left(\frac{1}{2}b\right)^2$$

→ Tells us how many "1's" we need for a perfect square

Step 3

"Owe" bank (-)

"Savings" (+)

Factoring

Step 4 Make a box, fill it with new terms. Find the outside

ax^2	px
qx	c

Step 2 Find 2 #'s

that multiply $a \cdot c$
and add to b

$$p + q = b$$

Step 3 Rewrite the quadratic into 4 terms

$$ax^2 + px + qx + c$$

Example 1:

Convert $y = 3x^2 - 4x - 4$ to factored form.

$$y = \boxed{3}x^2 - \boxed{4}x - \boxed{4}$$

$$3 \cdot -4 = -12$$

$$\underline{-6x} + \underline{2x} = -4x$$

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

	<u>x</u>	<u>-2</u>
<u>3x</u>	$3x^2$	$-6x$
<u>2</u>	$2x$	-4

****Always check your factors by multiplying back to standard****

$$3x^2 + 2x - 6x - 4 = \boxed{3x^2 - 4x - 4} \checkmark$$

Example 2:

Convert to Factored Form: $y = \boxed{2}x^2 - 15x \boxed{-8}$

	<u>2x</u>	<u>1</u>
<u>x</u>	$2x^2$	x
<u>-8</u>	$-16x$	-8

$$2 \cdot -8 = -16$$

$$\begin{array}{c} \diagup \quad \diagdown \\ -16x + 1x = -15x \end{array}$$

Check:



$$y = (2x + 1)(x - 8)$$

Example 3:

Convert to Factored Form: $y = 2x^2 - 13x + 20$

	<u>X</u>	<u>-4</u>
<u>2x</u>	$2x^2$	$-8x$
<u>-5</u>	$-5x$	20

$$2 \cdot 20 = 40$$

$$\begin{array}{c} \diagdown \quad \diagup \\ -8x \quad +5x = -13x \end{array}$$

$$y = (x-4)(2x-5)$$

Check:

