Warm Up

5/22

Quadratic or not?

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

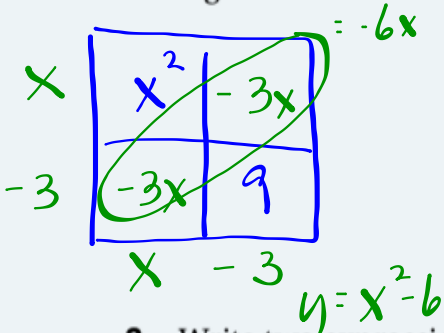
YES!

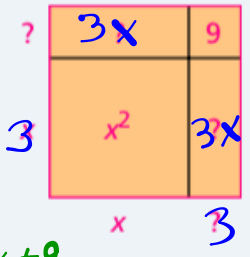
$x^3 - x^3 - 5x^2 = -5x^2$

Always expand when you are checking to see if an expression is quadratic or not.

Problem 2.3

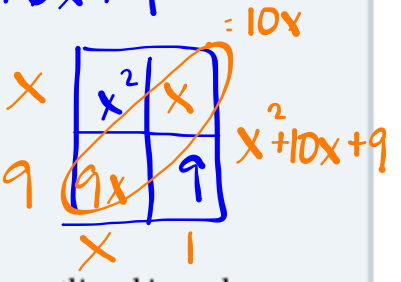
A **1.** Copy the diagram below. Replace each question mark with the correct length or area.





$y = x^2 - 6x + 9$

$x^2 + 6x + 9$



2. Write two expressions for the area of the rectangle outlined in red.

B Consider the expression $x^2 + bx + 8$.

There are 4! Find them all ☺

1. Choose a value for b that gives an expression you can factor. Then, write the expression in factored form.

$b = -6$ $x^2 - 6x + 8$

$b = 9$ $x^2 + 9x + 8$

2. Compare your work with your classmates. Did everyone write the same expressions? Explain.

C For parts (1)–(3), find values of r and s that make the equations true.

1. $x^2 + 10x + 24 = (x + 6)(x + 4)$

2. $x^2 + 11x + 24 = (x + 3)(x + 8)$

$x^2 + 3x + 8x + 24$

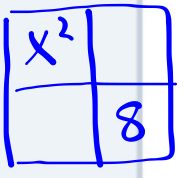
3. $x^2 + 25x + 24 = (x + r)(x + s)$

$x^2 + 24x + x + 24$

4. Describe the strategies you used to find the values of r and s in parts (1)–(3).

$b = 6$ $x^2 + 6x + 8$

$b = -9$ $x^2 - 9x + 8$



D Alyse sees a pattern in Question C. She says she can use the Distributive Property to factor the expression $x^2 + 10x + 16$. She writes:

$$\begin{aligned} x^2 + 10x + 16 &= x^2 + 2x + 8x + 16 && (1)\\ &= x(x + 2) + 8(x + 2) && (2)\\ &= (x + 2)(x + 8) && (3) \end{aligned}$$

Is Alyse correct? Explain what she did at each step.

Did you notice a pattern when factoring?

ax^2+bx+c

b: sum of the factors of c

	x	6
x	x^2	$6x$
4	$4x$	24

ax^2+bx+c

$x^2+6x+4x+24$

$x^2+10x+24$

$10x$: sum of factors of c

24: c

	x	6
x	x^2	$6x$
4	$4x$	24

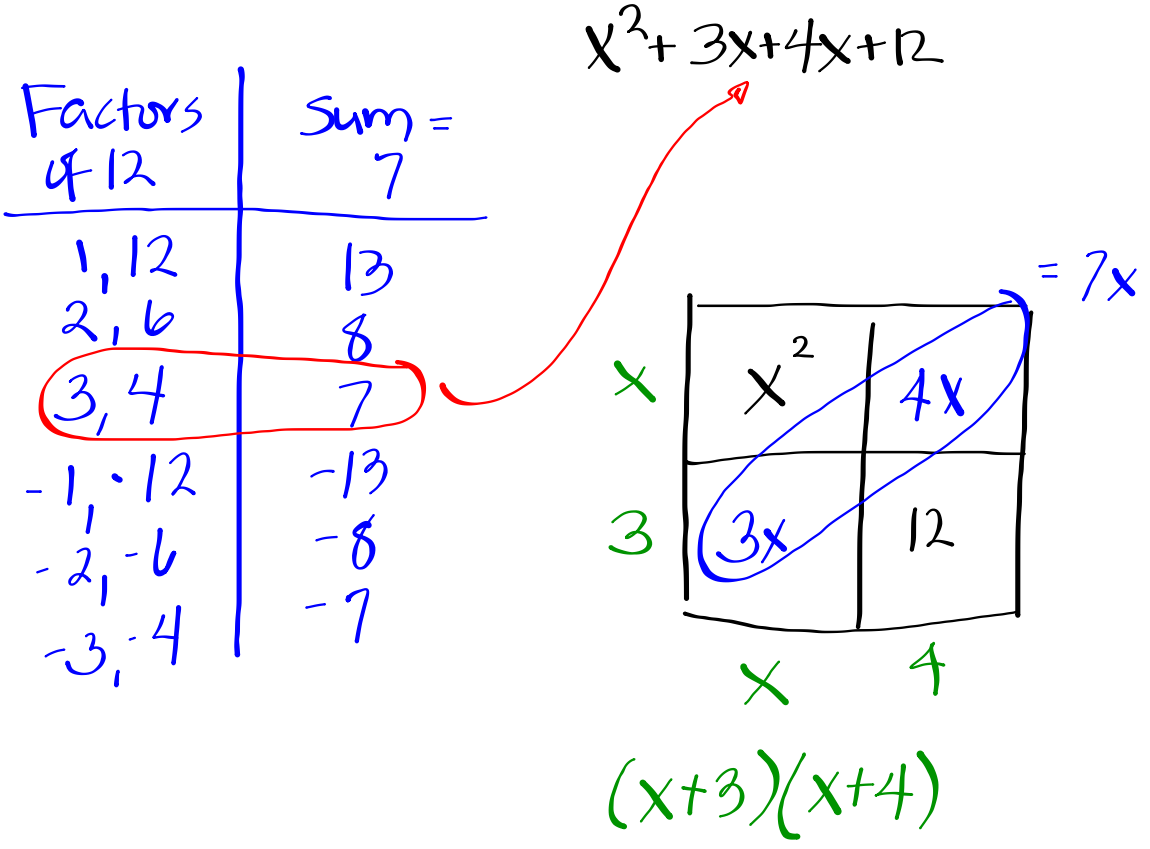
$= 10x$

$(x+4)(x+6) = x^2+10x+24$

Factored Form — Expanded Form

$x^2 + 7x + 12$

We need factors of 12 that add up to 7.

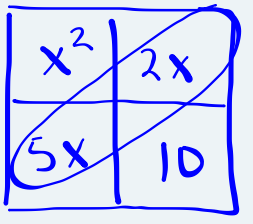


Classwork

Problem 2.3 continued

E Use the Distributive Property to factor each expression.

1. $x^2 + 5x + 2x + 10$
2. $x^2 + 11x + 10$
3. $x^2 + 3x - 10$
4. $x^2 - 8x + 15$
5. $15 - 14x - x^2$
6. $2x^2 + 7x + 5$



$= 7x$

F Recall the expressions for the area of the rectangle in Problem 2.1: $n^2 - 4$ and $(n - 2)(n + 2)$. The expression $n^2 - 4$ is a **difference of squares.** After factoring and expanding quadratic expressions, the students in Mr. Towle's class claimed they could use the Distributive Property to show that the expressions for the area of the rectangle in Problem 2.1 were equivalent.

1. Are the students correct? Can you use the Distributive Property to show that $n^2 - 4 = (n - 2)(n + 2)$? Explain.
2. What are the factors of each expression?
   a. $x^2 - 9$
   b. $x^2 - 25$

Homework

Finish classwork