LESSON MAKER PRO

Expression X-Ray

Spot structure, then rewrite with purpose.

HIGH SCHOOL · HSA-SSE.A.2

CCSS.Math.Content.HSA-SSE.A.2 "Use the structure of an expression to identify ways to rewrite it. For example, see x 4 - y 4 as (x 2) 2 - (y 2) 2, thus recognizing it as a difference of squares that can be factored as (x 2 - y 2)(x 2 + y 2)."

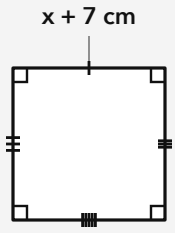
NAME _____ DATE _____

SEE THE PATTERN

Look for a common factor, a difference of squares, or a repeated binomial. For example, x^2-36 can be viewed as x^2-6^2, so it can be rewritten with matching plus and minus binomials.

WORKED EXAMPLE

Use the square to write its area in expanded form and as a squared binomial.



1. Area = (x+7)(x+7).
2. Multiply: x^2+14x+49.
3. The repeated factor is $(x+7)^2$.

Answer: $x^2+14x+49 = (x+7)^2$ cm^2

PRACTICE 4 problems

1 Factor completely: x^2-81

ANSWER _____

2 Factor completely: $6x^2$+18x

ANSWER _____

3 Rewrite as a squared binomial: x^2+16x+64

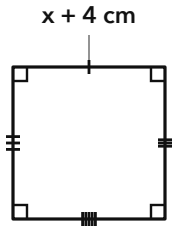
ANSWER _____

4 Factor completely: $4x^2$-121

ANSWER _____

APPLY IT Show your work

1 A student designs a square album cover. Use the figure to write its area in expanded form and as a squared binomial.



ANSWER _____

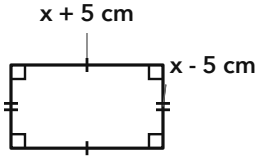
2 A theater club builds a square LED frame with side length 3x cm, then removes a square center with side length 12 cm. Factor the remaining area, $9x^2-144$.

WORK SPACE

ANSWER _____

CHALLENGE One step up

The rectangle is shown. Write its area in two equivalent forms. Then explain why the forms are equal.



WORK SPACE AND ANSWER

Expression X-Ray

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Factor completely: x^2-81	**$(x-9)(x+9)$**
2	Factor completely: $6x^2+18x$	**$6x(x+3)$**
3	Rewrite as a squared binomial: $x^2+16x+64$	**$(x+8)^2$**
4	Factor completely: $4x^2-121$	**$(2x-11)(2x+11)$**

PART 2 · APPLY IT

1. **$x^2+8x+16 = (x+4)^2$ cm^2** Multiply the two equal side lengths, (x+4)(x+4). The repeated factor gives the squared-binomial form.
2. **$9(x-4)(x+4)$ cm^2** Factor out 9 to get $9(x^2-16)$. Then factor the difference of squares.

CHALLENGE

$(x+5)(x-5)$ cm^2 = x^2-25 cm^2. The factors have the same first term and opposite constants, so the middle terms cancel.

Accept equivalent factored forms with factors in either order. For the challenge, accept an explanation that identifies a difference of squares or cancellation of the opposite middle terms.