LESSON MAKER PRO

Structure Spotters

Rewrite expressions to reveal useful patterns.

HIGH SCHOOL · HSA-SSE.A

CCSS.Math.Content.HSA-SSE.A "Interpret the structure of expressions"

NAME _____ DATE _____

SEE THE HIDDEN PARTS

Look for a greatest common factor or a familiar pattern before you multiply or solve. Factoring rewrites a sum or difference as a product, which can make the expression easier to interpret.

WORKED EXAMPLE

Factor completely: $11p^2 + 77p$

1. The greatest common factor of both terms is 11p.
2. Factor out 11p: $11p(p + 7)$.
3. Check by distributing 11p back into the parentheses.

Answer: $11p(p + 7)$

PRACTICE 6 problems

1 Factor completely: $3x^2 + 12x$

ANSWER _____

2 Factor completely: $8y^2 - 48y$

ANSWER _____

3 Factor completely: $9a^3 + 27a^2$

ANSWER _____

4 Rewrite as a product of binomials: $x^2 - 36$

ANSWER _____

5 Rewrite as a product of binomials: $4m^2 - 81$

ANSWER _____

6 Rewrite as a perfect-square expression: $t^4 - 10t^2 + 25$

ANSWER _____

APPLY IT Show your work

1 The drama club is making a rectangular backdrop with an area of $6x^2 + 30x$ square feet. One side is $6x$ feet long. Rewrite the area expression to find the length of the other side.

WORK SPACE

ANSWER _____

2 A student-run phone repair booth models its net earnings with $E(n) = n^2 - 64$, where n is the number of repairs completed. Rewrite E(n) as a product, then find the nonnegative value of n when the earnings are 0.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Without multiplying, factor $12x^2 - 27$ completely. In one sentence, explain which two structures you used.

WORK SPACE AND ANSWER

ANSWER KEY

Structure Spotters

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Factor completely: $3x^2 + 12x$	**$3x(x + 4)$**
2	Factor completely: $8y^2 - 48y$	**$8y(y - 6)$**
3	Factor completely: $9a^3 + 27a^2$	**$9a^2(a + 3)$**
4	Rewrite as a product of binomials: $x^2 - 36$	**$(x - 6)(x + 6)$**
5	Rewrite as a product of binomials: $4m^2 - 81$	**$(2m - 9)(2m + 9)$**
6	Rewrite as a perfect-square expression: $t^4 - 10t^2 + 25$	**$(t^2 - 5)^2$**

PART 2 · APPLY IT

1. **6x(x + 5); the other side is x + 5 feet.** Factor out the common factor 6x from $6x^2 + 30x$. The two factors represent the side lengths.
2. **E(n) = (n - 8)(n + 8); n = 8.** Recognize a difference of squares and factor $n^2 - 64$. Set the factors equal to 0, then reject the negative number of repairs.

CHALLENGE

$3(2x - 3)(2x + 3)$. First factor out 3, then use the difference of squares in $4x^2 - 9$.

Accept equivalent factored forms with factors in a different order. For the perfect-square item, accept $(5 - t^2)^2$ as an equivalent expression.