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

CHALLENGE

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

_____

_____

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.