ALBERT

Name _____ Date _____

Rewriting Expressions Using Structure Worksheet

Algebra 1 · Common Core 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 $(x^2 - y^2)(x^2 + y^2)$.

Practice

Builds the skill step by step.

1. Which is $x^2 - 9$ factored?

   A. $(x - 3)(x + 3)$

   B. $(x - 3)^2$

   C. $(x - 9)(x + 1)$

   D. $(x + 3)^2$

2. Which is $x^2 + 6x + 9$ factored?

   A. $(x + 9)(x + 1)$

   B. $(x + 3)^2$

   C. $(x - 3)^2$

   D. $(x + 3)(x - 3)$

3. What is the greatest common factor of $6x^2 + 9x$?

   A. 3

   B. $6x$

   C. $3x$

   D. $9x$

4. What is $x^2 - 25$ when $x = 7$?

5. Which is $4x^2 - 1$ factored?

   A. $(4x - 1)(x + 1)$

   B. $(2x - 1)^2$

   C. $(4x + 1)(x - 1)$

   D. $(2x - 1)(2x + 1)$

6. Use $(50 + 1)(50 - 1)$ to find 51×49.

7. How can you rewrite $x^4 - y^4$ as a difference of squares?

   A. $(x^2 - y^2)(x^2 + y^2)$

   B. $(x - y)^4$

   C. $(x^2 - y^2)^2$

   D. $(x^4 - y)(x + y^4)$

8. Which is $2x + 6$ factored?

   A. $2(x + 6)$

   B. $2(x + 3)$

   C. $x(2 + 6)$

   D. $6(x + 2)$

9. Which is $x^2 - 16$ factored?

   A. $(x - 8)(x + 2)$

   B. $(x - 4)^2$

   C. $(x - 4)(x + 4)$

   D. $(x + 16)(x - 1)$

10. Use $(100 - 1)^2$ to find 99^2.

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On Level

Grade-level practice.

1. Which is $x^4 - 16$ factored completely?

   A. $(x^2 - 4)(x^2 + 4)$

   B. $(x - 2)^4$

   C. $(x^2 - 8)(x^2 + 2)$

   D. $(x - 2)(x + 2)(x^2 + 4)$

2. Which is $9x^2 - 12x + 4$ factored?

   A. $(3x - 2)^2$

   B. $(3x + 2)^2$

   C. $(9x - 4)(x - 1)$

   D. $(3x - 4)(3x + 1)$

3. Use the difference of squares to find $103^2 - 97^2$.

4. Which is $x^3 - 4x$ factored completely?

   A. $x(x^2 - 4)$

   B. $x(x - 2)(x + 2)$

   C. $(x - 2)(x + 2)$

   D. $x^2(x - 4)$

5. Treat $(x + 1)$ as one quantity. Which is $(x + 1)^2 - 4$ factored?

   A. $(x + 1)(x - 3)$

   B. $(x + 5)(x - 3)$

   C. $(x - 1)(x + 3)$

   D. $(x - 1)^2$

6. Which is $2x^2 - 8$ factored completely?

   A. $2(x^2 - 4)$

   B. $(2x - 4)(x + 2)$

   C. $(x - 2)(x + 4)$

   D. $2(x - 2)(x + 2)$

7. Explain how to see $x^4 - 81$ as a difference of squares and factor it completely.

8. Which is $x^2 + 10x + 25$ factored?

   A. $(x + 5)^2$

   B. $(x + 25)(x + 1)$

   C. $(x - 5)^2$

   D. $(x + 5)(x - 5)$

9. Find $x^2 - y^2$ when $x = 15.5$ and $y = 4.5$.

10. Which is $25 - x^2$ factored?

    A. $(x - 5)(x + 5)$

    B. $(5 - x)(5 + x)$

    C. $(5 - x)^2$

    D. $(25 - x)(1 + x)$

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Challenge

Multi-step and word problems that stretch it.

1. Which is $16x^4 - 1$ factored completely?

   A. $(4x^2 - 1)(4x^2 + 1)$

   B. $(2x - 1)^4$

   C. $(2x - 1)(2x + 1)(4x^2 + 1)$

   D. $(4x - 1)(4x + 1)$

2. Which equals $(x^2 + 1)^2 - 4x^2$?

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

   B. $(x^2 + 1 - 2x)^2$

   C. $x^4 - 3$

   D. $(x - 1)^2(x + 1)^2$

3. How can $x^6 - 1$ be written as a difference of squares?

   A. $(x^3 - 1)(x^3 + 1)$

   B. $(x^2 - 1)(x^4 + 1)$

   C. $(x^6 - 1)^2$

   D. $(x - 1)^6$

4. Use $(1000 + 1)(1000 - 1)$ to find 1001×999.

5. Which is $3x^2 - 27$ factored completely?

   A. $3(x^2 - 9)$

   B. $3(x - 3)(x + 3)$

   C. $(3x - 9)(x + 3)$

   D. $(x - 3)(3x + 9)$

6. If $x + y = 7$, what is $x^2 + 2xy + y^2$?

7. If $x^2 - y^2 = 40$ and $x + y = 10$, what is $x - y$?

8. Which equals $(a + b)^2 - (a - b)^2$?

   A. $2ab$

   B. 0

   C. $4ab$

   D. $2a^2 + 2b^2$

9. Which is $4x^2 + 12xy + 9y^2$ factored?

   A. $(4x + 9y)(x + y)$

   B. $(2x - 3y)^2$

   C. $(2x + 3y)(2x - 3y)$

   D. $(2x + 3y)^2$

10. Explain why $x^2 + 9$ can't be factored as a difference of squares.