Math 1

Difference of Squares

take note

Key Concept Factoring Perfect-Square Trinomials

Algebra For every real number a and b:

$$a^2 + 2ab + b^2 = (a + b)(a + b) = (a + b)^2$$

$$a^2 - 2ab + b^2 = (a - b)(a - b) = (a - b)^2$$

Examples $x^2 + 8x + 16 = (x + 4)(x + 4) = (x + 4)^2$

$$4n^2 - 12n + 9 = (2n - 3)(2n - 3) = (2n - 3)^2$$

How to recognize a perfect – square trinomial.

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Example 1: Factoring a Perfect-Square Trinomial **x^2 - 12x + 36**

Practice:

a. x^2 + 6x + 9

b. x^2 – 14x + 49

c. h^2 + 8h + 16

Digital images are composed of thousands of tiny pixels rendered as squares. Suppose the area of a pixel is $4x^2$ + 20 x + 25? What is the length of one side of the pixel?

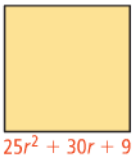
Practice:

21. 

$100r^2 - 220r + 121$

22. 

$64r^2 - 144r + 81$

23. 

$25r^2 + 30r + 9$

take note

Key Concept Factoring a Difference of Two Squares

Algebra For all real numbers a and b:

$$a^2 - b^2 = (a + b)(a - b)$$

Examples $x^2 - 64 = (x + 8)(x - 8)$

$25x^2 - 36 = (5x + 6)(5x - 6)$

Example 2: Factoring a Difference of Two Squares **$z^2 - 9$**

Practice:

a. $V^2 - 100$ b. $s^2 - 16$ c. $w^2 - 144$

Example 3: Factoring a Difference of Two Square. **$16x^2 - 81$**

Practice:

a. $25d^2 - 64$ b. $36v^2 - 25$ c. $64q^2 - 81$

Example 4: Factoring out a Common Factor **$24g^2 - 6$**

Practice:

a. $12t^2 - 48$ b. $12x^2 + 12x + 3$ c. $8s^2 - 64s + 128$

Work on these and what you do not finish is for homework.

Difference of Squares: $x^2 - y^2 = (x - y)(x + y)$ or $x^2 + 0xy - y^2$

1. $x^2 - 16$
2. $25 - x^2y^2$
3. $81x^2 - 4$
4. $4x^2 - 1$
5. $16x^2 - 121$
6. $49x^2 - 36$

Mixed Review: Factor out a GCF, and then apply a factor rule

1. $24g^2 - 6$
2. $12t^2 - 48$
3. $12x^2 + 12x + 3$
4. $5x^2 + 13x + 30$
5. $100x^2 - 81y^2$
6. $2x^2 + 12x + 10$
7. $x^2 - 12x + 36$
8. $4x^2 + 20x + 25$
9. $4x^2 + 24x + 36$
10. $x^2 - 14x + 49$
11. $16m^2 - 72m + 81$
12. $81r^2 - 90r + 25$

AREA: FACTORING APPLICATION

1. The area of a rectangle is $g^2 + 3g - 10$, find the dimensions of the rectangle.

2. The area of a square is $m^2 + 10m + 25$. Find the length of each side.

3. Find the perimeter of the square in question #2.

4. The volume of a rectangular prism is $8m^3 - 128m$. Find the length of all three sides. How many sides are binomials?

5. The area of a rectangle is $10w^2 - 19w - 15$. If one of the sides is $(2w - 5)$, what is the length of the other side?

6. Is it possible for a rectangle to have an area of $2y^2 + 11y + 18$, if the side lengths are binomials?

7. The area of a rectangular book cover is $4x^2 - 6x - 40$. The width of the book cover is $2x - 8$, what is the length of the cover?

8. The area of a rectangular swimming pool is $10x^2 - 19x - 15$. The length of the pool is $5x + 3$. What is the width of the pool?

9. The area of a square rug is $4k^2 + 12k + 9$. What is the perimeter of the rug?

10. Factor: $72g^2h - 43gh + 6h$

11. Factor: $8x^3 + 4x^2 - 18x - 9$

12. Which binomial is a factor of $2n^2 - 32n$?
    a. $2n - 8$ b. $n + 16$ c. $n - 16$ d. $n + 4$

13. Which binomial is a factor of $14a^2 - 15a + 4$?
    a. $7a + 2$ b. $14a - 1$ c. $7a - 1$ d. $7a - 4$