Thursday

Math 10 Unit 3 Name

Lesson 8: Difference of Squares

Recall:

Simplify the following

eg) $(x-5)(x+5) = x^2+5x-5x-25 = x^2-25$

$(x-3)(x+3) = x^2+3x-3x-9 = x^2-9$

$(2x-3)(2x+3) = 4x^2+6x-6x-9 = 4x^2-9$

In these examples, we have expanded a product of 2 binomials to form a pattern called:

difference of squares.

In general:

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

A difference of squares binomial occurs where both terms in the binomial are being subtracted and each term is a perfect square.

What is a perfect square?

1, 4, 9, 16, 25, 36, 49...

So, expressions that look like:

a^2-b^2	factor into	$(a-b)(a+b)$

Ex. Factor the following:

a) $x^2 - 49$

$x^2 - 7^2 = (x-7)(x+7)$

b) $4a^2 - 9b^2$

$(2a)^2 - (3b)^2 = (2a-3b)(2a+3b)$

c) $5x^2 - 125y^2$ $= 5(x^2 - 25y^2)$

$= 5(x^2 - (5y)^2) = 5(x-5y)(x+5y)$

d) $7x^2 - 7a^2 = 7(x^2 - a^2)$

$\boxed{= 7(x-a)(x+a)}$

e) $8 - 50a^2b^2$

$= 2(4 - 25a^2b^2)$

$= 2(2^2 - (5ab)^2) = 2(2-5ab)(2+5ab)$

f) $x^2 + 25$

not factorable!

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a) $2x^2 - 5xy + 2y^2$ decomposition

$= 2x^2 - 4xy - xy + 2y^2$

$= 2x(x-2y) - y(x-2y)$

$= (x-2y)(2x-y)$

x	+
4	-5

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Factor!

1) $x^2 - 25$ _____

2) $a^2 - 64$ _____

3) $n^2 - 100$ _____

4) $25n^2 - 100$ _____

5) $4m^2 - 9$ _____

6) $400r^2 - 49$ _____

7) $9r^2 - 1$ _____

8) $4x^2 - b^2$ _____

9) $16x^2 - 9b^2$ _____

10) $m^2 - n^2$ _____

11) $25x^2 - 144$ _____

12) $4x^2 - z^2$ _____

13) $121a^2 - 36z^2$ _____

14) $1 - 25x^2$ _____

15) $1 - k^2$ _____

16) $8x^2 - 32$ _____

17) $3x^2 - 27a^2$ _____

18) $7x^2 - 7a^2$ _____

19) $2x^2 - 50$ _____

20) $3x^2 - 12y^2$ _____

21) $10x^2 - 640$ _____

22) $8 - 50a^2b^2$ _____

23) $xy^2 - x^3$ _____

24) $20a^2b^2 - 5a^4b^4$ _____

25) $a^2 - a^2b^2$

Odd #'s

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Factor!

1) $x^2 - 25$ $(x+5)(x-5)$

2) $a^2 - 64$ _____

3) $n^2 - 100$ $(n+10)(n-10)$

4) $25n^2 - 100$ _____

5) $4m^2 - 9$ $(2m-3)(2m+3)$

6) $400r^2 - 49$ _____

7) $9r^2 - 1$ $(3r-1)(3r+1)$

8) $4x^2 - b^2$ _____

9) $16x^2 - 9b^2$ $(4x-3b)(4x+3b)$

10) $m^2 - n^2$ _____

11) $25x^2 - 144$ $(5x-12)(5x+12)$

12) $4x^2 - z^2$ _____

13) $121a^2 - 36z^2$ $(11a-6z)(11a+6z)$

14) $1 - 25x^2$ _____

15) $1 - k^2$ $(1-k)(1+k)$

16) $8x^2 - 32$ _____

17) $3x^2 - 27a^2$ $3(x^2-9a^2)$ $3(x+3a)(x-3a)$

18) $7x^2 - 7a^2$ _____

19) $2x^2 - 50$ $2(x^2-25)$ $2(x+5)(x-5)$

20) $3x^2 - 12y^2$ _____

21) $10x^2 - 640$ $10(x^2-64)$ $10(x+8)(x-8)$

22) $8 - 50a^2b^2$ _____

23) $xy^2 - x^3$ $x(y^2-x^2)$ $x(y+x)(y-x)$

24) $20a^2b^2 - 5a^4b^4$ _____

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