The Math Dawg

Completing the Square

Jan 28-9:11 PM

Perfect Square Trinomials

THERE WERE CERTAIN SPECIAL CASES OF TRINOMIALS THAT COULD BE FACTORED TO A BINOMIAL SQUARED

examples:

$x^2 - 6x + 9$

$x^2 + 4x + 4$

$x^2 - 10x + 25$

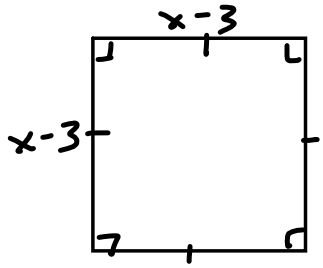
$3x^2 - 42x + 147$

$-x^2 + 2x - 1$

Perfect Square Trinomials

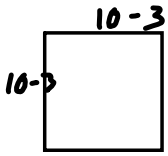
LITERALLY, THEY ARE CALLED "PERFECT SQUARE TRINOMIALS" BECAUSE THEIR DIMENSIONS FORM A SQUARE.

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



SUPPOSE $x=10$

THEN



AREA $= 7^2 = 49$

How to Complete a Square

example: COMPLETE THE SQUARE $12x+x^2$

① x^2+12x WRITE IN DESCENDING POWERS OF x

② TAKE $\frac{1}{2}$ OF $12 = \frac{1}{2}\cdot 12 = 6$

③ TAKE $6^2 = 36$

④ $x^2+12x+36$

⑤ FACTOR

$x^2+12x+36$

$= (x+6)^2$

How to Complete a Square

FOR THE FOLLOWING EXPRESSIONS COMPLETE THE SQUARE TO MAKE THEM PERFECT SQUARE TRINOMIALS. THEN FACTOR THE COMPLETED SQUARE AS A BINOMIAL SQUARED.

1. $x^2+2x \rightarrow x^2+2x+\_\_ = (\_\_)^2$

2. $x^2+9x \rightarrow x^2+9x+\_\_ = (\_\_)^2$

3. $x^2+\frac{1}{8}x \rightarrow x^2+\frac{1}{8}x+\_\_ = (\_\_)^2$

4. $-x^2+6x \rightarrow -(\_\_\ \_\_\ \_\_)$
$= -(\_\_)^2$

5. $3x^2-12x \rightarrow$
$3(\_\_\ \_\_\ \_\_)$
$= 3(\_\_)^2$

How to Complete a Square

example: USE THE COMPLETE THE SQUARE TECHNIQUE TO WRITE A FUNCTION EQUAL TO
$F(x) = x^2+16x$

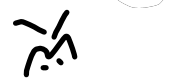
How to Complete a Square

example: USE THE COMPLETE THE SQUARE TECHNIQUE TO WRITE A FUNCTION EQUAL TO $F(x)=2x^2+20x$

How to Complete a Square

example: USE THE COMPLETE THE SQUARE TECHNIQUE TO WRITE A FUNCTION EQUAL TO $F(x)=-x^2+20x$

How to Complete a Square



THIS ONE GIVES MANY STUDENTS DIFFICULTY.

example: USE THE COMPLETE THE SQUARE TECHNIQUE TO WRITE A FUNCTION EQUIVALENT TO $F(x) = x^2 + x$

How to Complete a Square

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example: USE THE COMPLETE THE SQUARE TECHNIQUE TO WRITE A FUNCTION EQUAL TO $F(x) = 3x^2 + 2x$

How to Complete a Square

example: USE THE COMPLETE THE SQUARE TECHNIQUE TO WRITE A FUNCTION EQUAL TO $f(x) = -x^2 + 5x$

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