FACTORING TRINOMIALS OF THE FORM $ax^2 + bx + c$

IE FACTOR $3x^2 - 10x + 8$

— WE NEED TO FIND TWO NUMBERS WHICH EQUAL $a \cdot c$ AND ADD UP TO b

$3 \cdot 8 = 24$ $(-6)(-4) = 24$

$-6 + -4 = -10$

— REWRITE THE EXPRESSION WITH THESE NUMBERS

$3x^2 - 6x - 4x + 8$

— SPLIT IN HALF AND FACTOR BOTH SIDES.

- WHAT IS COMMON ON BOTH SIDES IS ONE FACTOR,

$$3x^2 - 6x \mid -4x + 8$$

$$3x(x-2) \mid -4(x-2)$$

WHAT IS LEFT IS THE OTHER.

$$(x-2)(3x-4)$$ DONE''

- IF FACTOR $4x^2 - 20x + 25$ $4x25 = 100$

$$4x^2 - 20x + 25$$ $(-10)(-10) = 100$

$$4x^2 - 10x \mid -10x + 25$$ $-10 + -10 = -20$

$$2x(2x-5) -5(2x-5)$$

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

$\underline{IE}$ FACTOR $6x^2 + 17xy + 12y^2$ $6 \times 12 = 72$

$$6x^2 + 8xy + 9xy + 12y^2 \qquad \begin{array}{l} 8 \cdot 9 = 72 \\ 8 + 9 = 17 \end{array}$$

$$2x(3x + 4y) + 3y(3x + 4y)$$

$$(3x + 4y)(2x + 3y)$$

* THIS IS CALLED FACTORING BY DECOMPOSITION *

— PERFECT SQUARE TRINOMIALS

$$(x + y)^2 \qquad VS. \qquad (x - y)^2$$

$$(x + y)(x + y) \qquad \qquad (x - y)(x - y)$$

$$x^2 + xy + xy + y^2 \qquad \qquad x^2 - xy - xy + y^2$$

$$x^2 + 2xy + y^2 \qquad \qquad x^2 - 2xy + y^2$$

IN OUR ANSWER

- 1ST TERM IS THE SQUARE OF 1ST TERM

  OF THE BINOMIAL

- LAST TERM IS THE SQUARE OF THE LAST

  TERM OF THE BINOMIAL

- THE MIDDLE TERM IS TWICE THE PRODUCT

  OF THE SQUARE ROOT OF THE FIRST AND

  LAST TERM

  $$\left(3x + 4y\right)^2$$

  MIDDLE TERM $\left(3 \times 4\right) = 12 \times 2 = 24$

H/w

$9x^2 + 24xy + 16y^2$

fl 236 # 3, 4, 6, 7 A, C, E

5 All