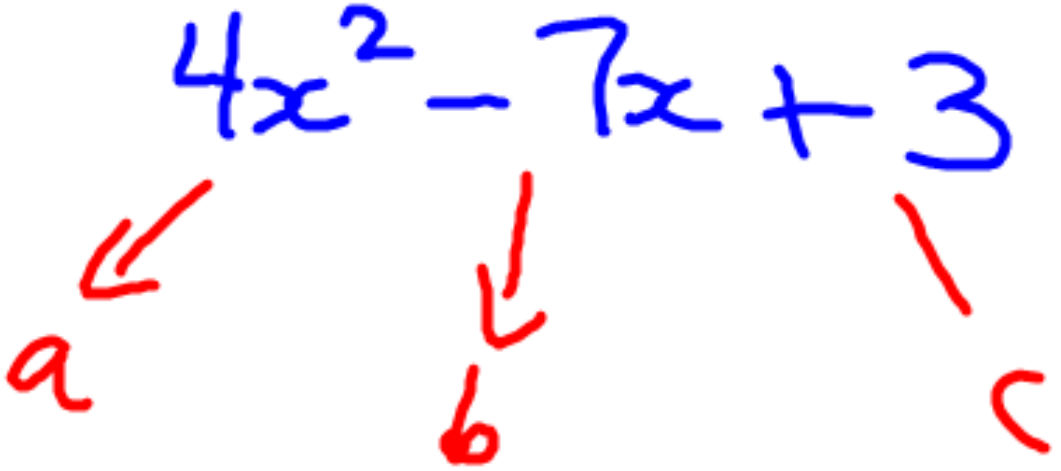
3.6 Polynomial of the Form $ax^2 + bx + c$

Lesson Focus

Extend the strategies for multiplying binomials and factoring trinomials



Reminder – FOIL

To distribute a binomial multiplied by a binomial remember FOIL

F – (first)(first)
0 – (outside)(outside)
I – (inside)(inside)
L – (last)(last)

$$(h + 11)(h + 5)$$

Do the same thing with coefficients on the variables

Example

Expand: $(3d + 4)(4d + 2)$

$= 12d^2 + 6d + 16d + 8$

$= 12d^2 + 22d + 8$

$(-2g + 8)(7 - 3g)$

$= -14g + 6g^2 + 56 - 24g$

$= 6g^2 - 38g + 56$

Example – Your Turn

Expand: $(5e + 3)(2e + 4)$

$(6t - 9)(7 - 5t)$

Homework

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8, 9, 10

Teach Me How To Factor!

1. Hi to Low

2. GCF-factor out any GCF

3. Numbers
-we need two numbers that multiply to equal "c" term and add to equal "b" term.

4. Signs
-if a (+) at the back factors will have same sign.
-if a (-) at the back factors will have different signs.

Reminder – Factoring

- *When we had a trinomial in the form:*

$$x^2 + bx + c$$

- *We needed two numbers whose:*
  - *Sum was b*
  - *Product was c*

Factoring $ax^2 + bx + c$

- *Now with a trinomial in the form:*

$$ax^2 + bx + c$$

- *We need two numbers whose:*
  - *Sum is b*
  - ***Product is (a)(c)***

- ***Then split the middle term (b) with the who numbers determined in the previous step***

Example

Arrange in standard form

Need two numbers d and e such that:

d+e=b

(d)(e)=(a)(c)

Split the middle term

bx = dx + ex

Take the GCF out of the first two terms, and the last two terms

The remainder NEED TO BE the same for both

Set up brackets

Factor.

a) $4h^2 + 20h + 9$

Factor.

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$P = 36$

$S = 20$ $\rightarrow 18, 2$

$= 4h^2 + 18h + 2h + 9$

$= 2h(2h + 9) + 1(2h + 9)$

$= (2h + 9)(2h + 1)$

Factor.

a) $4h^2 + 20h + 9$

$4h^2 + 2h + 18h + 9$

$= 2h(2h+1) + 9(2h+1)$

$(2h+1)(2h+9)$

Factor.

a) $4h^2 + 20h + 9$

$(2h + 1)(2h + 9)$

Example

Arrange in standard form

Need two numbers d and e such that:

d+e=b

(d)(e)=(a)(c)

Split the middle term

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Set up brackets

Factor.

b) $6k^2 - 11k - 35$

Factor.

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$P = -210$

$S = -11$ $\Big\}$ $10, -21$

$= 6k^2 + 10k - 21k - 35$

$= 2k(3k + 5) - 7(3k + 5)$

$= (3k + 5)(2k - 7)$

Example – Your Turn

Factor.

a) $4g^2 + 11g + 6$

$P = 24$

$S = 11$

$8, 3$

$4g^2 + 8g + 3g + 6$

$= 4g(g+2) + 3(g+2)$

$= (g+2)(4g+3)$

b) $6m^2 - 7m - 10$

$(6m+5)(m-2)$

Example – Your Turn

Factor.

a) $3s^2 - 13s - 10$

b) $6x^2 - 21x + 9$

Example – Your Turn

$(-2p+5)(-4p-1)$

Factor.

a) $8p^2 - 18p - 5$

$P = -40$

$S = -18$

$-20, 2$

$= 8p^2 + 2p - 20p - 5$

$= 2p(4p+1) - 5(4p+1)$

$= (4p+1)(2p-5)$

b) $24h^2 - 20h - 24$

b) $24h^2 - 20h - 24$

$= 4(6h^2 - 5h - 6)$

$P = -36$

$S = -5$

$-9, 4$

$= 4[6h^2 - 9h + 4h - 6]$

$= 4[3h(2h-3) + 2(2h-3)]$

$= 4(2h-3)(3h+2)$

$(3h-2)(8h+12)$

$4(2h+3)(3h-2)$

Homework

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 # 13, 15, 18, 19,Handout