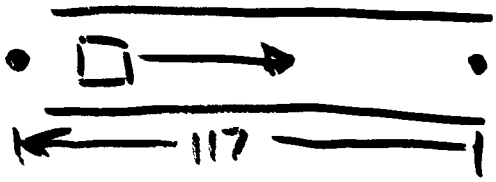
Alg. 1-BE - Monday 1-26-09

Let b = (rate) speed of boat ($\frac{\text{miles}}{\text{hr}}$)

c = speed of current ($\frac{\text{miles}}{\text{hr}}$)

$\boxed{d = rt}$



d = 117 downstream

d = 117 upstream

$\boxed{234}$ miles total

t = 13 hrs downstream

t = 39 hrs upstream

① SOLVE

$$\begin{cases} 117 = (b+c)13 \\ 117 = (b-c)39 \end{cases}$$

d = (rate) time

② WHY DO rivers flow downstream?

- QUIZ 3, HW 3 return

MathForum.org great site for math help. Go to "Ask Dr. Math" and use the Search box. I want there and input **factor by grouping** and found a very good explanation and some useful tips that are not in the book and are new to me:

Ex) A 4 term polynomial has 3 possible groups: **a + b + c + d**

① (a + b) + (c + d)

② (a + c) + (b + d)

③ (a + d) + (b + c)

If FBG works, 2 of these groups will work and 1 will not!

If FBG does not work, 0 of the groups will work!

A "trinomial" with one variable of degree 2 is written in standard form if it is written in descending order by degree:

$$ax^2 + bx + c$$

Ex) $3x^2 + 5x + 2$ $a = 3$, $b = 5$, $c = 2$

Ex) $9x^2 - 4x - 3$ $a = 9$, $b = -4$, $c = -3$

Ex) $-8x^2 + x$ $a = -8$, $b = 1$, $c = 0$

Ex) $7x^2$ $a = 7$, $b = 0$, $c = 0$

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if $a = 0$, you no longer have a polynomial of degree 2, you have a polynomial of degree 1 which is linear.

$y = f(x) = mx + b$ or, for comparison

$y = f(x) = ax + b$ linear function, x^1 is highest degree

$y = f(x) = ax$ STILL A LINE, a direct variation

$y = f(x) = ax^2 + bx + c$ x^2 is highest degree, not a line but a curve called a parabola

$y = f(x) = ax^2$ STILL A PARABOLA

QUADRATIC FUNCTION

if $y = 0$

$0 = ax^2 + bx + c$ STANDARD FORM OF A QUADRATIC EQUATION

$0 = (\quad)(\quad)$ FACTOR

$0 = a \cdot b$ SOLVE BY ZPP

IF $ax^2 + bx + c$ is prime, can't solve BY FACTORING

How to factor ax^2+bx+c IF it can be factored (is not prime)

MAGIC NUMBER METHOD

FACTOR: $2x^2+4x^2+17x=-5$

Step 1 Put in standard form: ax^2+bx+c

$$6x^2+17x+5=0$$

$a=6$
$b=17$
$c=5$

Step 2 Find 2 magic numbers whose sum is $b=17$ and product is $ac=30$

$$6x^2+17x+5=0$$

b = sum = 17

ac = prod = 30

$+2$ $+15$ Put + or − next to numbers

Step 3 Split middle term into magic terms and FBG!

$$(6x^2+2x)+(15x+5)=0$$

$$2x(3x+1)+5(3x+1)=0$$

$$(3x+1)(2x+5)=0$$

Solve Equation w/ ZPP

$$x=\left\{-\frac{1}{3},\frac{5}{2}\right\}$$

(Ex) Solve $7x^2+22x+3=0$

$7x^2+22x+3=0$ in S.F. ✓

b = sum = 22

ac = prod = 21

+1 +21

$(7x^2+1x)+(21x+3)=0$

$x(7x+1)+3(7x+1)=0$

$(7x+1)(x+3)=0$

$\boxed{x=\{-\frac{1}{7},-3\}}$

(Ex) $8a^2-9a-5=4-3a$

$8a^2-6a-9=0$

b = sum = -6

ac = prod = -72

+6 −72

LOOK (SIGNS!)

72
2 36
6 6
(2)(3)(2)(3)

$(8a^2-12a)+(6a-9)=0$

$4a(2a-3)+3(2a-3)=0$

$(2a-3)(4a+3)=0$

$\boxed{x=\{\frac{3}{2},-\frac{3}{4}\}}$

EX4 PG 497

Homework:

Pg. 499 # 10 to 12
35 to 38

WE just Finished CH. 9-3 and 9-4
