

Alg. 1 BE MONDAY 2-2-09

① $\frac{1}{2} + \frac{1}{3} = ?$

② $\frac{1}{x} + \frac{1}{y} = ?$ {  Tip
STUDY HOW YOU DID #1 }

③ $\frac{1}{a} + \frac{1}{4a^2} = ?$

④ $\frac{-c}{a} + \frac{b^2}{4ac} = ?$

⑤ $\sqrt{\frac{4}{9}} = ?$

⑥ $\pm \sqrt{49} = ?$

⑦ SOLVE: $x^2 = 121$

- Return/review graded Homework 4/Quiz 4
- EXAM 1 THURSDAY (Weds if Thurs. Conflicts)
- Congrats Freddy & Phil!

1.
A NOTE ABOUT RADICALS $\Rightarrow \sqrt{\quad}$

$$\sqrt{\frac{4}{9}} = \frac{\sqrt{4}}{\sqrt{9}} = \frac{2}{3}$$

$\Uparrow$
LOOK, you CAN change

$$\frac{\sqrt{x}}{\sqrt{y}} \text{ to } \sqrt{\frac{x}{y}} \text{ OR BACK } \frac{\sqrt{x}}{\sqrt{y}}$$

Also: $x^2 = 100$

$$\sqrt{x^2} = \sqrt{100}$$

$$\boxed{x = \pm 10}$$

* WHEN YOU SOLVE AN EQUATION
BY $\sqrt{\quad}$ BOTH SIDES, YOUR
ANSWER WILL BE $\pm$ NOT JUST +

$$\underline{\underline{\text{CK:}}} (-10)^2 = 100 \checkmark \quad \underline{\underline{\text{CK}}} (10)^2 = 100 \checkmark$$

RECALL our 3 special patterns from Ch. 8-8 you are supposed to know cold:

$$\textcircled{1} (a+b)^2 = (a+b)(a+b) = a^2 + 2ab + b^2$$

$$\textcircled{2} (a-b)^2 = (a-b)(a-b) = a^2 - 2ab + b^2$$

$$\textcircled{3} (a+b)(a-b) = a^2 - b^2$$

DIFFERENCE OF SQUARES (DAS)

Just like 16 is called a perfect square because $\sqrt{16} = 4$ or $4 \cdot 4 = 16$

The first two trinomial $a^2 \pm 2ab + b^2$ are called perfect square trinomials

because $\sqrt{a^2 \pm 2ab + b^2} = a \pm b$ or $(a \pm b)(a \pm b) = a^2 \pm 2ab + b^2$

The discriminant of a perfect square trinomial is zero. That is, $b^2 - 4ac = 0$. It is factorable, the factors will be identical.

The long way:

$$\text{Solve } x^2 + 6x + 9 = 0$$

$$\text{sum} \Rightarrow 6$$

$$\text{prod} \Rightarrow 9$$

$$+ \overset{\diagup}{3} + \overset{\diagdown}{3}$$

$$\begin{aligned} b^2 - 4ac \\ (6)^2 - 4(1)(9) \\ 36 - 36 = 0 \end{aligned}$$

Since $a = 1$

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

$$x = \{-3\}$$

↑ ↑
"Two answers" to a second degree equation, both are the same.

Short way:

$$\text{Solve } x^2 + 6x + 9 = 0$$

$$\begin{aligned} \text{① perfect sq.?} \\ \text{Yes,} \\ \sqrt{x^2} = x \end{aligned}$$

$$\begin{aligned} \text{② perfect sq.?} \\ \text{Yes, } \sqrt{9} = 3 \end{aligned}$$

$$\text{③ Is } 6x = 2(x)(3) ? \checkmark$$

"2a b"

Use pattern:

$$\begin{aligned} (x+3)(x+3) &= 0 \\ (a+b)(a+b) \end{aligned}$$

$$x = \{-3\}$$

Ex 1b
Pg 509

Solve $9y^2 - 12y + 4 = 0$

OK for
GCF 1st!

$$\begin{array}{cc} \sqrt{9} & \sqrt{4} \\ 3y & 2 \\ \diagdown & \diagup \\ 2 \cdot 3y \cdot 2 & \checkmark \end{array}$$

$$(3y - 2)(3y - 2) = 0$$

$$y = \left\{ \frac{2}{3} \right\}$$

Ex 1a
Pg 509

Solve $16x^2 + 32x + 64 = 0$

$$16(x^2 + 2x + 4) = 0$$

$$\begin{array}{cc} \sqrt{x^2} & \sqrt{4} \\ x & 2 \\ \diagdown & \diagup \\ 2 \cdot x \cdot 2 & \text{NO} \end{array}$$

TRY Sum $\Rightarrow 2$
Prod $\Rightarrow 4$

? ? Is it prime?

$$\begin{aligned} a &= 1 \\ b &= 2 \\ c &= 4 \end{aligned}$$

$$\begin{aligned} b^2 - 4ac \\ (2)^2 - 4(1)(4) \end{aligned}$$

$$4 - 16 = -12 \quad \text{NO REAL SOLUTION!}$$

Ex
Pg 502

Solve $N^2 - 25 = 0$

$$\begin{array}{ccc} \sqrt{N^2} & & \sqrt{25} \\ \text{"} & \downarrow & \text{"} \\ N & - & 5 \\ & \text{Difference} & \end{array}$$

$$(N-5)(N+5) = 0$$

$$\boxed{N = \{5, -5\}}$$

OR $N^2 - 25 = 0$

$$N^2 = 25$$

$$\sqrt{N^2} = \pm \sqrt{25}$$

$$\boxed{N = \pm 5}$$

Ch. 9-5 Factoring $a^2 - b^2$ DOS¹⁸
Ch 9-6 Factoring $a^2 \pm 2ab + b^2$ PST¹⁸

- Homework: Pg 518 # 53-55
57, 61, 63.