

Math 3345

Fundamentals of Higher Mathematics

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Course Info

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Reading for Wednesday, January 22

pgs. 19-23

HW5 Due Monday, January 27

▶ Section 2 Exercises: 15, 17, 19

Bonus Problem (Hand in any time before April 18)

Section 2 Exercise 18

Warm-up Problems

Problem 39

Solution to Problem 10a-d

Solving algebraic equations

We can apply logic to problem solving

Example 40

Question: For what real numbers x is the following statement true?

$$x^2 + 3x - 4 = 0.$$

Answer:

$$\begin{aligned} & x^2 + 3x - 4 = 0 \\ \text{iff } & (x + 4)(x - 1) = 0 \\ \text{iff } & x = -4 \text{ or } x = 1. \end{aligned}$$

Thus $x = -4$ or $x = 1$ are the only real solutions to $x^2 + 3x - 4 = 0$.

Solving algebraic equations

For any real numbers a, b, c

$$\frac{a}{b} = \frac{c}{b} \text{ implies } a = c$$

Note that if $b = 0$ then $\frac{a}{b} = \frac{c}{b}$ cannot be true.

However for any real numbers a, b, c

$$a = c \text{ does not imply } \frac{a}{b} = \frac{c}{b}.$$

For example $3 = 3$ does not imply that $\frac{3}{0} = \frac{3}{0}$.

Solving algebraic equations

Similarly for any real numbers a, b

$$\sqrt{a} = b \text{ implies } a = b^2$$

However for any real numbers a, b

$$a = b^2 \text{ does not imply } b = \sqrt{a}$$

For example $4 = (-2)^2$ does not imply that $-2 = \sqrt{4}$.