Equations

Summary week 4

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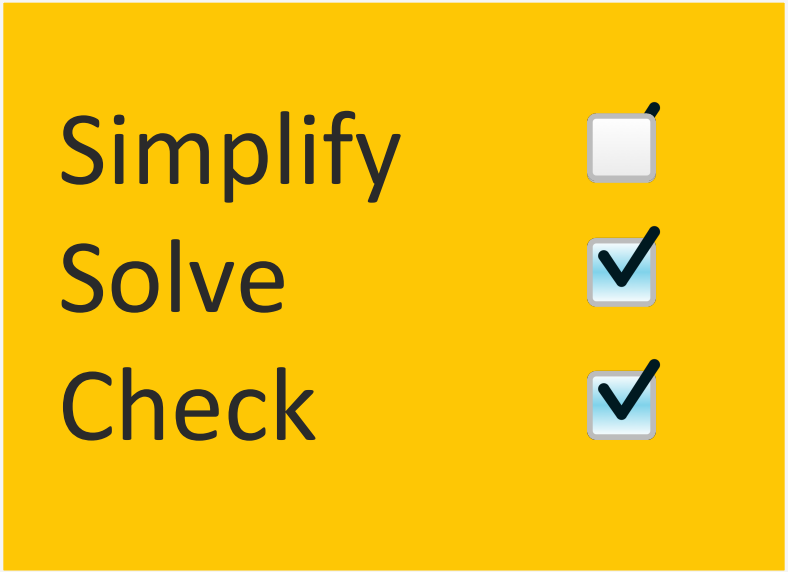
Solving equations



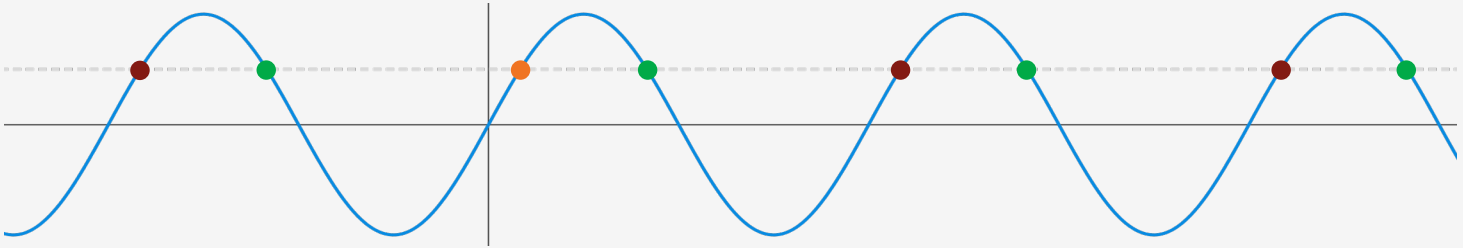
Solving trigonometric equations

Simplify to sin(x)=c or cos(x)=c

- Use a substitution
- Use a trigonometric identity

Solve basic equation sin(x)=c or cos(x)=c

- Find one solution (table, calculator)
- Use symmetries to obtain remaining solutions



Equations with exponentials and logarithms

Exponential functions:

Goal:
Simplify to $a^p = a^q$

- Use a single base
- Use a substitution

$$4^x = 2^{x^2} \rightarrow 2^{2x} = 2^{x^2}$$

$$2^x + 4^x = 6$$
$$y + y^2 = 6$$

$y = 2^x$

Equations with exponentials and logarithms

Exponential functions:

Goal:
Simplify to $a^p = a^q$

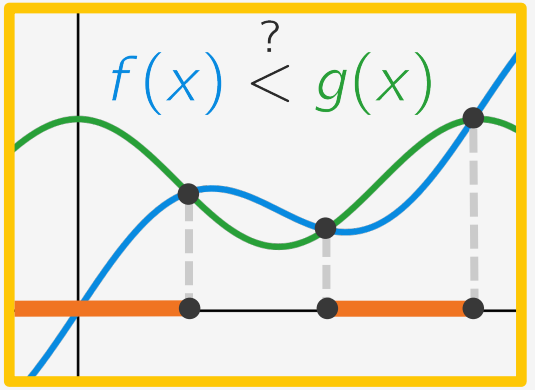
- Use a single base
- Use a substitution

Logarithms:

Goal:
Simplify to $\log_a(p) = \log_a(q)$

- Use a single base
- Use a substitution

Solving inequalities



Solve inequality $f(x) < g(x)$, $f(x) \leq g(x)$, . . .

Step 1: find points at which:

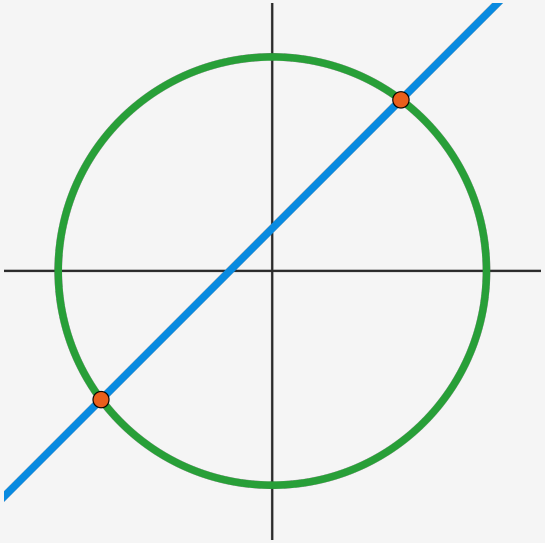
- both sides are equal
- function is not defined, or discontinuous

Step 2: check inequality on each interval

Step 3: check inequality in each boundary point

Step 4: gather to find solution set

Systems of equations



Substitution method

- Solve simplest equation for y
- Substitute y in second equation
- Solve second equation for x
- Substitute x in expression for y

The roles of x and y can be interchanged.

Good luck with your homework!

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