# Math Sub Plans Week, High School

Week-long sub plans: five days of print and go work for grades 9 to 12, planned Monday to Friday.

**PREVIEW**

## What is included

- Sub binder: notes, the filled-in week plan, a blank schedule, class list, Monday opener (11 pages)
- Math sets for five days (15 pages)
- Calm puzzles and reset sheets (10 pages)
- Math team tasks (9 pages)
- Math games (10 pages)
- Answer keys (12 pages)

## How it works

1. Open the week plan. Every set already has its day and page number.
2. Each day: one math set per period (a lesson with worked examples, practice and a challenge), a calm puzzle, a team task and a game for the last 15 minutes.
3. The sub needs no subject knowledge. Every answer is in the key.
4. Print in color or ink-saver black and white, US Letter or A4.

**What this preview shows:** the filled-in week plan, the note to the substitute, the Monday opener, and all of Day 1 (the math set, the calm block, the team task and the game), one answer-key page and one ink-saver page. Every product page is watermarked. The full kit has 68 pages.







# This Week's Plan

Filled in for you: run the day's set in every period you teach. Keep it as it is, or use the blank schedule on the next page for your own order.

| WHEN | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY |
|---|---|---|---|---|---|
| **Start of class** | **Meet Your Sub**<br>p. 10 · 15 min, every period | Attendance, voice level | Attendance, voice level | Attendance, voice level | Attendance, voice level |
| **Main work, every period** | **Math 1**<br>Linear Equations and Inequalities<br>p. 13 | **Math 2**<br>Slope and Graphing Lines<br>p. 21 | **Math 3**<br>Systems of Equations<br>p. 30 | **Math 4**<br>Exponents and Polynomials<br>p. 39 | **Math 5**<br>Area, Volume and Right Triangles<br>p. 48 |
| **Early finishers or a loud moment** | **Word Search and Reset Sheet**<br>p. 16 | **Sudoku and Grounding Sheet**<br>p. 24 | **Secret Codes and Control Sheet**<br>p. 33 | **Maze and Brain Dump**<br>p. 42 | **Word Ladders and Three Good Things**<br>p. 51 |
| **Block period or extra time** | **Largest to Smallest**<br>p. 18 | **The Pocket Park Plan**<br>p. 26 | **Twenty Four Squares**<br>p. 35 | **The Fountain Arc**<br>p. 44 | **Calculator Debate**<br>p. 53 |
| **Last 15 minutes, if earned** | **Whiteboard Jeopardy**<br>p. 19 | **Paper Password**<br>p. 28 | **Class Feud**<br>p. 37 | **Classroom Millionaire**<br>p. 46 | **Mystery Box**<br>p. 55 |

## How to use this plan

- Page numbers point to the first page of each set. Copy one per student.
- The calm block is always allowed: a period that runs short, a loud class, or anyone who finishes early.
- The game is the reward. Skip it on a day the class has not earned it.

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# Note to the Substitute

Grades 9 to 12 · five days · every set runs from the printout alone

## Thank you for covering my classes this week

Everything you need is in this binder. The front pages (important information, weekly schedule, class list) are filled in for this week. After them come the work sets, one per day: **Math 1** is Monday's set, **Math 2** is Tuesday's, and so on to **Math 5** on Friday. Run the day's set in every period you teach that day. Each set is one period (45 to 55 minutes), stands alone, and has its own answer key at the back of the binder, so you never have to make anything up or know the subject. The first page of every set tells you what to say. Every set ends with a challenge, so it stretches to a 90-minute block when you need it.

After the subject sets come the shared blocks, one of each per day. The **calm block** is always allowed: for a period that runs short, a loud class, or anyone who finishes early. The **team task** fills a period on its own. The **game** is the reward slot: fifteen minutes, from the script, when a class has earned it.

## Each day has

- One Math set (one period, with a challenge to stretch it)
- A calm and quiet block: a puzzle page and a reset sheet
- A team task for groups of four
- A paper game from the script

## If the class is loud

- Set a voice level with a number, 0 to 3, and use it all week (the Day 1 opener explains it).
- Switch to the calm block. Nobody needs to move.
- Every set has a challenge at the end, so fast finishers always have something.
- If a set is not working, stop it and use the calm block or the team task. Every set starts cold.

## At the end of each day

Please fill in that day's line on the "How it went" page. It takes two minutes and I read every word.

Did this kit work well for your class? A quick review helps other teachers find it and earns you TpT credits. Thank you!

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# Meet Your Sub

Day 1 opener, 15 minutes at the start of every period on Monday, before the set. Nothing to prepare.

Opener

## Sub script (the same five minutes in every class)

1. **Before first period, fill in the introduction sheet** on the next page, once, for the whole day. Keep it short and honest. A high school class reads a sub in about ten seconds, so give them something real to read.
2. **Introduce yourself from the sheet** in two minutes. Then hold up the Ask the Sub list and take three questions from raised hands. Three, not ten. Say when you are done taking questions.
3. **Read the class agreement out loud** and ask this period to add one line of their own. Write that line on the board for the period. The line they wrote is the one they keep.
4. **Set the voice level with a number** from 0 to 3, using the box at the bottom of the sheet. Say which level today's set needs, and use the same numbers in every class all week.
5. **Start the set** with one sentence: this is today's work, it has a challenge at the end, and the calm block is always allowed when you are finished.

## If the room is loud

- Skip the questions. Keep the agreement and the voice level, and say the number out loud.
- Start the set sooner. Work on the desk beats a speech about behavior every time.
- Name the level again after four minutes. A number is easier to follow than a lecture.

## If a period runs ten minutes short

- Run Common Ground in groups of four. Six minutes of work, four minutes of reading out.
- Or hand out the reset sheet from the calm block and let the room go quiet early.
- Or have each student write one question they would ask the teacher when they get back.

## Monday checklist (before first period)

- [ ] Read the Important Information page: office extension, exits, the nurse, the teacher next door.
- [ ] Check the class list for allergies, medical needs, early releases and students who carry a pass.
- [ ] Find today's set on the weekly schedule and count copies for every period, plus five spares.
- [ ] Fill in the About Your Sub sheet once and post it where the back row can read it.
- [ ] Write the voice levels 0 to 3 on the board and leave them there all week.
- [ ] Keep the answer keys inside the binder, not face up on the desk.

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# Math Set 1: Linear Equations and Inequalities

Math · Day 1

Read the four worked examples and the rules, then do the quick check at the bottom of this page. Show your working.

### 1 Two-step equation

4x + 7 = 31. Undo the addition first: subtract 7 from both sides to get 4x = 24. Then undo the multiplication: divide both sides by 4.

**x = 6**

### 2 Variables on both sides

5x - 3 = 2x + 12. Move the variable to one side: subtract 2x from both sides to get 3x - 3 = 12. Add 3, then divide by 3.

**x = 5**

### 3 Distribute first

3(2x - 5) + 4 = 25. Multiply the 3 through the parentheses: 6x - 15 + 4 = 25. Combine the constants: 6x - 11 = 25. Add 11, divide by 6.

**x = 6**

### 4 Inequality, negative coefficient

-4x + 2 <= 18. Subtract 2 to get -4x <= 16, then divide both sides by -4. Dividing by a negative number flips the inequality sign.

**x >= -4**

## Remember

- **Whatever you do to one side, do to the other.** That is the whole method: keep the equation balanced while you strip away everything around the x.
- **Undo in reverse order:** addition and subtraction first, then multiplication and division.
- **Distribute before you combine.** 3(2x - 5) means 6x - 15, not 6x - 5.
- **Inequalities work the same way, with one rule added:** multiplying or dividing both sides by a negative number flips the sign. 2 < 5, but -2 > -5.
- **Check your answer** by putting it back into the original equation. Both sides must give the same number.

## Quick check: one of each before you start the practice

1. 6x - 5 = 31 _____

2. 8x - 1 = 3x + 19 _____

3. 3(x - 4) = 21 _____

4. -2x + 1 > 9 _____

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# Math Set 1: Practice

Sixteen problems in four blocks. Put the answer on the line and the working in the space beside it.

Math · Day 1

## A. Solve the two-step equations

1. 3x + 7 = 22

2. 5x - 8 = 37

3. -4x + 9 = 33

4. x/6 + 5 = 9

## B. Variables on both sides

1. 7x - 3 = 4x + 12

2. 9x + 5 = 2x - 16

3. 6x - 11 = 10x + 9

4. 3x + 8 = x + 20

## C. Distribute, then solve

1. 4(x + 3) = 32

2. 2(3x - 5) = 26

3. 5(x - 2) + 3x = 22

4. 2(3x + 4) = 5(x + 3)

## D. Solve the inequalities

1. 2x + 9 > 21

2. 5x - 4 <= 26

3. -3x > 18

4. -2x + 8 >= 14

Block D: write the answer as an inequality, for example x > 3 or x <= -2. Watch for the sign flip.

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# Math Set 1: Word Problems and Challenge

Six word problems, then three challenges for anyone who finishes early. Write the equation first, then solve it.

Math · Day 1

1. The sum of three consecutive integers is 96. Write an equation and find the smallest of the three integers.

2. A gym charges a $40 joining fee plus $25 a month. Priya has paid $290 in all. How many months has she been a member?

3. The length of a rectangle is 4 cm more than twice its width. The perimeter is 56 cm. Find the width.

4. Taxi company A charges $6 plus $2.50 a mile. Company B charges $10 plus $2.00 a mile. At how many miles do the two rides cost the same?

5. Jonah has $75. Parking costs $9 and each ticket costs $12. Write an inequality and find the greatest number of tickets he can buy.

6. Amara scored 82, 91 and 78 on her first three tests. What must she score on the fourth test for her mean to be at least 85?

## Challenge

1. Solve, then check your answer by substituting it back into the original equation: 3(2x - 4) - 5 = 2(x + 3) + 1

2. The area of a triangle is A = (1/2)bh. Solve the formula for h, then find h when A = 48 and b = 12.

3. Theo solved -3x + 4 >= 19 and wrote x >= -5. His arithmetic is right but his answer is wrong. Explain the error and write the correct answer.

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# Calm Block, Day 1: Word Search

Find all 12 math words. Any direction, including backward and diagonal. Pencils only, voices at 0.

Calm · Day 1

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X | W | I | N | T | E | G | E | R | N | E | W | A | X |
| T | A | N | G | E | N | T | I | Z | O | P | I | D | L |
| M | E | W | E | I | A | O | V | H | I | O | E | O | X |
| S | Y | X | F | A | C | T | O | R | T | L | Q | F | E |
| I | F | U | N | C | T | I | O | N | A | S | L | T | T |
| R | A | V | V | G | M | W | Y | K | U | N | Q | P | R |
| C | Z | A | H | B | G | A | M | W | Q | V | A | V | E |
| U | R | R | L | F | B | V | T | D | E | R | Y | X | V |
| M | Y | I | Q | A | Y | K | Q | R | A | W | P | G | I |
| P | L | A | Y | B | C | C | A | B | I | O | V | L | P |
| C | M | B | U | S | L | I | O | M | N | X | A | X | X |
| T | X | L | R | T | E | L | D | E | F | N | Y | P | B |
| Q | C | E | Z | K | A | B | N | A | C | K | G | P | E |
| G | E | J | H | Z | W | T | H | N | R | L | Z | T | S |

EQUATION · FUNCTION · EXPONENT · PARABOLA · VARIABLE · INTEGER · RADICAL · TANGENT · VERTEX · MATRIX · FACTOR · SLOPE

## Faster than reading every square

- Hunt the rare letters first. Only one word in the list has a Q in it, so every Q in the grid is worth a second look.
- Scan one row at a time for a word's first two letters, then check all eight directions from that square.
- Cross a word off the list the second you circle it, or you will search for it twice.

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# Calm Block, Day 1: Reset Sheet

For one person, at your own pace. Nobody collects this and nobody reads it but you.

Calm · Day 1

## Two minutes, then back to it

This is not a mood test and it is not therapy. It is a short routine for the moments when your head is somewhere else and the work in front of you is going nowhere: slow the breath, put a name on the feeling, pick the next five minutes. Work down the page and stop at the bottom.

## Step 1: make the breath out longer

Breathe in through your nose while you count to four, then out through your mouth while you count to six. The long breath out is the part that slows your heart rate down. Six rounds, then stop.

Tick a box for each round so you are not counting in your head.

☐☐☐☐☐☐

## Step 2: name it

A feeling you can name gets smaller. Tired, annoyed, behind, worried, bored, flat, wired. One word is enough, and it does not have to be the right word.

Write yours on the first line below.

**Name it in one word, then write the sentence your head keeps repeating**

**What is actually true right now, in this room, that I could check in ten seconds**

**The next five minutes: what I will do the moment I put this sheet down**

## What usually helps me

- ☐ Water and a real breath of air
- ☐ Writing the thing down instead of holding it
- ☐ Two minutes of a puzzle or a doodle
- ☐ Starting the smallest piece of the work
- ☐ Standing up and stretching my shoulders
- ☐ Putting my phone face down in my bag
- ☐ Asking one person one question
- ☐ Deciding to deal with it after school

## My own line

Something that works for you that is not on that list.

**Right now I feel (circle one)**

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

1 = settled, 10 = about to boil over. Check the same number again in ten minutes. Down by one is the whole point.

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# Team Task, Day 1: Largest to Smallest

Groups of four. Voice level 2. No calculators and no phones. One sheet per group, one person writes, and no rank goes down until all four agree.

Team · Day 1

## The challenge

The twelve numbers below are all between 1,000 and 2,200, but they are dressed up as powers, roots, products and scientific notation. Some pairs are only a few apart. **Your job:** rank them from **1 (largest)** to **12 (smallest)** using reasoning, not a calculator. Work alone for five minutes and fill in "My rank". Then argue it out and agree on one set of group ranks. Every rank from 1 to 12 is used exactly once.

When every group is done, the sub reads out the exact values. The rule for the true order is simple and has no judgment calls: **exact value, largest first**. Write each value in, then score the difference.

| | NUMBER | MY RANK | GROUP RANK | EXACT VALUE | TRUE RANK | DIFFERENCE |
|---|---|---|---|---|---|---|
| A | $\sqrt{3{,}000{,}000}$ | | | | | |
| B | $43 \times 47$ | | | | | |
| C | $\pi \times 20^2$ | | | | | |
| D | $2^{11}$ | | | | | |
| E | $1.3 \times 10^3$ | | | | | |
| F | $3^7$ | | | | | |
| G | $1 \div 0.0005$ | | | | | |
| H | $11^3$ | | | | | |
| I | $45^2$ | | | | | |
| J | $2.1 \times 10^3$ | | | | | |
| K | $1{,}000 \times \sqrt{2}$ | | | | | |
| L | $12^3$ | | | | | |
| **Total (lower is better)** | | | | | | |

## Scoring

For each row: group rank minus true rank, and drop the minus sign. Add the twelve numbers.

- **0 to 8:** excellent: your group reasons like a calculator
- **9 to 18:** good
- **19 to 30:** fair
- **Over 30:** look again at the powers of 2 and the square roots.

Tools that help: $2^{10} = 1{,}024$, $\sqrt{2}$ is about 1.414, $\sqrt{3}$ is about 1.732, $\pi$ is about 3.14.

## Defend one call

Pick the closest pair your group ranked correctly. Show, without a calculator, how you knew which one is bigger.

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# Game, Day 1: Whiteboard Jeopardy

Sub script and questions. 15 minutes at the end of the period, or whenever the class has earned it.

Game · Day 1

## Set up (2 minutes)

1. Draw a 5 by 5 grid on the board, or tape up the board sheet. Write the five category names across the top and the values 100 to 500 down each column.
2. Teams of four to six. Team 1 picks a category and a value.
3. Read the question. The team gets 15 seconds and one answer. Right: they take the points and pick again. Wrong: the next team may steal, then play moves on.
4. Cross the square off. Highest total when time is up wins.

## Read this out

"One voice per team: pick a captain who says the final answer. Shouted answers do not count and the square is dead. Team 1, choose a category and a value."

Keep the running score in a corner of the board. If a team argues a call, the script wins and the game moves on. The bold answer is the one to accept, but take a clear equivalent too (0.125 for 1/8, 84 for 84 square units).

### Algebra

**100** Solve for x: 3x + 7 = 22. What is x?
**5**

**200** Solve for x: 5(x minus 2) = 35. What is x?
**9**

**300** If 2x + 3y = 12 and x = 3, what is y?
**2**

**400** What are the two solutions of x squared minus 5x + 6 = 0?
**2 and 3**

**500** If x + y = 10 and x minus y = 4, what is x?
**7**

### Statistics

**100** What is the mean of 4, 8, 10 and 14?
**9**

**200** What is the median of 3, 9, 4, 12 and 7?
**7**

**300** What is the range of 15, 22, 8, 30 and 19?
**22**

**400** What is the mode of 2, 5, 5, 7, 9, 9, 9 and 11?
**9**

**500** A fair die is rolled twice. What is the probability of two sixes?
**1/36**

### Functions

**100** If f(x) = 2x + 1, what is f(4)?
**9**

**200** What is the slope of the line through (1, 2) and (3, 8)?
**3**

**300** What is the y-intercept of the line 2x + y = 6?
**6**

**400** If g(x) = x squared minus 4, what is g(negative 3)?
**5**

**500** What is the x-coordinate of the vertex of y = x squared minus 6x + 2?
**3**

### Exponents

**100** What is 3 to the fourth power?
**81**

**200** What is 7 to the zero power?
**1**

**300** Simplify x cubed times x to the fifth. What is the new exponent?
**8**

**400** What is 2 to the negative 3 power, written as a fraction?
**1/8**

**500** What is 4 to the three halves power?
**8**

### Geometry

**100** What is the area of a rectangle that is 7 by 12?
**84 square units**

**200** Two angles of a triangle are 50 and 60 degrees. What is the third?
**70 degrees**

**300** What is the circumference of a circle with radius 5, in terms of pi?
**10 pi**

**400** A right triangle has hypotenuse 13 and a leg of 5. How long is the other leg?
**12**

**500** What is the volume of a cylinder with radius 3 and height 4, in terms of pi?
**36 pi**

### Final Wager: Linear Models

Play this when the board is clear, or when two minutes are left. Announce the category, then every team writes a secret wager of up to the points it already has. Read the question. Teams get 60 seconds of silent writing, then hold their answers up together.

A phone plan costs 20 dollars a month plus 5 dollars per gigabyte. One month the bill was 45 dollars. How many gigabytes were used?
**5 gigabytes**

Right: add the wager. Wrong: subtract it. That is the final score.

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# Game, Day 1: The Board

Tape this to the whiteboard or copy it. Cross squares off as they are played.

Game · Day 1

| ALGEBRA | FUNCTIONS | GEOMETRY | STATISTICS | EXPONENTS |
|---|---|---|---|---|
| 100 | 100 | 100 | 100 | 100 |
| 200 | 200 | 200 | 200 | 200 |
| 300 | 300 | 300 | 300 | 300 |
| 400 | 400 | 400 | 400 | 400 |
| 500 | 500 | 500 | 500 | 500 |

## Scores

**Team 1**

**Team 2**

**Team 3**

**Team 4**

**Team 5**

**Team 6**

## Final Wager: Linear Models

Write your wager before you hear the question. A team may bet any amount up to the points it already has. Right answer: add the wager. Wrong answer: subtract it.

**Team 1**
WAGER
ANSWER

**Team 2**
WAGER
ANSWER

**Team 3**
WAGER
ANSWER

**Team 4**
WAGER
ANSWER

**Team 5**
WAGER
ANSWER

**Team 6**
WAGER
ANSWER

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# Answer Keys (1 of 12)

Teacher copy. Keep these pages out of the student sets.

## Math Set 1: Linear Equations and Inequalities

**Quick check:** 1. x = 6; 2. x = 4; 3. x = 11; 4. x < -4

**Solve the two-step equations:** 1. x = 5; 2. x = 9; 3. x = -6; 4. x = 24

**Variables on both sides:** 1. x = 5; 2. x = -3; 3. x = -5; 4. x = 6

**Distribute, then solve:** 1. x = 5; 2. x = 6; 3. x = 4; 4. x = 7

**Solve the inequalities:** 1. x > 6; 2. x <= 6; 3. x < -6; 4. x <= -3

**Word problems:** 1. 31 (the integers are 31, 32 and 33); 2. 10 months; 3. 8 cm wide (the length is 20 cm); 4. 8 miles (both cost $26); 5. 5 tickets (12t + 9 is at most 75, so t is at most 5.5); 6. 89 or higher

**Challenge:** 1. x = 6 (6x - 17 = 2x + 7, so 4x = 24); 2. h = 2A/b, so h = 8; 3. x <= -5; dividing both sides by -3 flips the inequality sign

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# Math Set 1: Practice

Sixteen problems in four blocks. Put the answer on the line and the working in the space beside it.

Math · Day 1

## A. Solve the two-step equations

1. 3x + 7 = 22

2. 5x - 8 = 37

3. -4x + 9 = 33

4. x/6 + 5 = 9

## B. Variables on both sides

1. 7x - 3 = 4x + 12

2. 9x + 5 = 2x - 16

3. 6x - 11 = 10x + 9

4. 3x + 8 = x + 20

## C. Distribute, then solve

1. 4(x + 3) = 32

2. 2(3x - 5) = 26

3. 5(x - 2) + 3x = 22

4. 2(3x + 4) = 5(x + 3)

## D. Solve the inequalities

1. 2x + 9 > 21

2. 5x - 4 <= 26

3. -3x > 18

4. -2x + 8 >= 14

Block D: write the answer as an inequality, for example x > 3 or x <= -2. Watch for the sign flip.

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# In the full kit

Five days, planned and ready to print.

**68** pages in color and ink-saver B&W, US Letter and A4

**5** days, each with its own sets, calm puzzle, team task and game

**15** pages of math sets with worked examples

**12** answer-key pages, every answer checked

**Thank you!** If this works for your class, a quick review helps other teachers find it, and earns you TpT credits.



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