



High School Math Sub Plans, 2 Weeks

Two complete week binders of high school math, grades 9 to 12, for any course: Algebra 1, Geometry or Algebra 2 classes. Every day has individual work and a team task, and every task has a "say this" script.

PREVIEW

What is included

- Week 1 binder (68 pages) and Week 2 binder (65 pages): 133 pages
- 26 front pages: binder cover, important information, note to the sub, the week plan filled in, schedule, set index, class list, how it went, Monday opener
- 20 solo blocks (10 math sets, 10 calm blocks) and 10 team tasks for groups of four
- A "say this to the class" script for all 42 tasks: 2 or 3 sentences the sub reads out
- A core task and a ★ challenge in every math set and team task
- 10 optional games, each on that day's math lesson, a fun way to end the class
- Answer keys for everything; color and ink-saver B&W, US Letter and A4

How it works

1. Leave both binders out. Each has its own filled-in plan with page numbers.
2. The sub reads the "say this" box out, then runs the day's math set in every period; students work on their own. Everyone does the core task, early finishers go on to the ★ challenge.
3. The calm block fits any gap, the team task fills a block period or extra time, the game the last 15 minutes.
4. No prep and no tech: print and go.

The 10 days: a math set, a team task and a game each day

1. Day 1: Math: Linear Equations and Inequalities · Team task: Largest to Smallest **Whiteboard Quiz Game**
2. Day 2: Math: Slope and Graphing Lines · Team task: The Pocket Park Plan **Paper Password**
3. Day 3: Math: Systems of Equations · Team task: Twenty Four Squares **Class Feud**
4. Day 4: Math: Exponents and Polynomials · Team task: The Fountain Arc **Classroom Millionaire**
5. Day 5: Math: Area, Volume and Right Triangles · Team task: Calculator Debate **Mystery Box**
6. Day 6: Math: Function Notation · Team task: Vending Machine Audit **Whiteboard Quiz Game**
7. Day 7: Math: Literal Equations and Formulas · Team task: Formula Help Desk **Paper Password**
8. Day 8: Math: Factoring Polynomials · Team task: Tile Rectangle Builders **Class Feud**
9. Day 9: Math: Percent Applications · Team task: Best Offer Rankings **Classroom Millionaire**
10. Day 10: Math: Two-Way Tables and Relative Frequency · Team task: Club Fair Survey Desk **Mystery Box**

What this preview shows: the note to the substitute, the Week 1 plan, more front pages, one page of every daily part, a full math set with its answer key, a calm block, a team task, the game types and one ink-saver page. Every product page is watermarked. The full product has 133 pages.



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. Every task starts with a short **Say this to the class** box under its title: read it out, and the class knows what to do and how to start.

Every student page has a core task first, then a ★ challenge. Every student does the core task. Students who finish early go on to the ★ challenge; it fills a few extra minutes, and nobody has to finish 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 optional: a fun way to end the class, or something for extra time. Fifteen minutes, from the script.

Each day has

- One Math set (one period, core task + ★ challenge on every page)
- A calm and quiet block: a math puzzle and a self-checking practice page
- 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 student page has a ★ challenge, 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!



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 p. 11 · 15 min, every period	Attendance, voice level	Attendance, voice level	Attendance, voice level	Attendance, voice level
Main work, every period	Math 1 Linear Equations and Inequalities p. 14	Math 2 Slope and Graphing Lines p. 22	Math 3 Systems of Equations p. 31	Math 4 Exponents and Polynomials p. 40	Math 5 Area, Volume and Right Triangles p. 49
Early finishers or a loud moment	Word Search and Quiet Practice p. 17	Term Match and Quiet Practice p. 25	Code Breaker and Quiet Practice p. 34	Word Scramble and Quiet Practice p. 43	Cross-Number and Quiet Practice p. 52
Block period or extra time	Largest to Smallest p. 19	The Pocket Park Plan p. 27	Twenty Four Squares p. 36	The Fountain Arc p. 45	Calculator Debate p. 54
Last 15 minutes (optional): a fun way to end the class, or for extra time	Whiteboard Quiz Game p. 20	Paper Password p. 29	Class Feud p. 38	Classroom Millionaire p. 47	Mystery Box p. 56

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 optional: a fun way to end the class, or something for extra time.

HS MATH SUB PLANS WEEK 1

High School Math, 5 Days of Print and Go Work

Teacher _____
Room _____
Grade and classes _____
Week of _____

Everything a sub needs for five days is in this binder: a filled-in weekly plan, a blank schedule, the class list, and for every day one Math set, a calm block, a team task and a paper game. Each set is one period, stands alone, and has its own answer key. Nothing needs subject knowledge, a login or a projector.



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HS Math Sub Plans Week 1: High School Math, 5 Days of Print and Go Work

Important Information

The page the sub reads first. Fill it in once and keep it current!

People to call

Office _____
Teacher next door _____
Nurse _____
Principal / admin _____
Tech help _____

Emergency procedures

Fire: exit and meeting point _____
Lockdown _____
Severe weather _____
Medical _____
Where the first aid kit is _____

Helpful students

Students who need extra support

Where things are

Attendance / how to take it _____
Paper, pencils, supplies _____
Hall passes _____
Copper, if the sub may use it _____

Class routines

Start of class _____
Bathroom _____
Phones _____
End of class _____

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Important Information

Weekly Schedule (Blank)

Put your order, write the set for each period (Monday: Math 1, Tuesday: Math 2, and so on) and the class next to each period. Cross out or rename periods to match the school day.

PERIOD / CLASS	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Period 1					
Class					
Period 2					
Class					
Period 3					
Class					
Period 4					
Class					
Period 5					
Class					
Period 6					
Class					
Period 7					
Class					

How to fill it in

- One set per period. Each set runs 45 to 55 minutes. If a period runs longer, the 30 challenges fit a few minutes, or add that day's team task.
- Same subject all day? Write the day's set in every period you teach. Planning, lunch and duty periods: cross them out.
- On Monday the opener (15 minutes) comes first in every period, then the set.
- The game is optional: put it in the last period as a fun way to end the class, or use it for extra time. The calm block goes in any gap.

Set naming

Sets are named by subject and day. Math 1 is Monday's set, Math 2 is Tuesday's, and so on to Math 5 on Friday. The set index lists every set with its minutes and page.

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Weekly schedule, blank

Class List and Dismissal

Notes: what a sub must know and how every student gets home. Copy one per class.

☐ bus (write the number) ☐ walks ☐ picked up (write who) ☐ after-school program ☐ other

★ in the notes, a student who finds the core task essay may start with the challenge.

STUDENT NAME	NOTES (ALLERGIES, NEEDS, HELPFUL, LEAVES EARLY)	HOME	BUS # / PICKED UP BY / PROGRAM
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
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26			
27			
28			
29			
30			

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Class list and dismissal

How It Went

For the sub: feedback, one line per day, two minutes at the end of each day. Check the boxes and go.

Monday

Sets done: _____ Class was: ☐ Great ☐ Fine ☐ Hard, see notes
Notes / stars of the day: _____

Tuesday

Sets done: _____ Class was: ☐ Great ☐ Fine ☐ Hard, see notes
Notes / stars of the day: _____

Wednesday

Sets done: _____ Class was: ☐ Great ☐ Fine ☐ Hard, see notes
Notes / stars of the day: _____

Thursday

Sets done: _____ Class was: ☐ Great ☐ Fine ☐ Hard, see notes
Notes / stars of the day: _____

Friday

Sets done: _____ Class was: ☐ Great ☐ Fine ☐ Hard, see notes
Notes / stars of the day: _____

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How it went

Meet Your Sub

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

Openers
"Hi everyone, I am covering math for your teacher this week, and each day you get one printed math set for this period. I will start with a short introduction and three of your questions, and then we go through the class agreement. Each page has a core task for everyone and a star challenge for when you finish."

Sub script (the same five minutes in every class)

- 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 needs a sub in about 10 seconds, so give them something real to read.
- Introduce yourself from the sheet in two minutes. They hold up the Ask the Sub list and take three questions from raised hands. There, not ten. Say when you are done taking questions.
- 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.
- 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.
- Start the set with one sentence: this is today's math, everyone does the core task first, the star challenge is for anyone who finishes, and the calm block is always allowed.

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 Odd One Out in groups of four. Six minutes of work, four minutes of reading out.
- Or hand out the Quiet Practice page from the day's 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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Day 1 opener: sub script

Math Set 3: Systems of Equations

Read the four worked examples and the notes. Then do the quick check, write every solution as a point.

Set Up the Task

Today's math is systems of equations, and you work in your own time. Read the four worked examples on page 1 first. Then, choose the one you want to solve. Write the answer as a point (x, y). Check if it is both equations, and try the other change on each page.

Elimination by adding

$x + y = 4$ and $2x + y = 13$. The first equation already tells you what y is, so plug $y = 4$ into the second: $2x + 4 = 13$. So $2x = 9$ and $x = 4.5$. Then $y = 4 - 4.5 = -0.5$. So the solution is $(4.5, -0.5)$.

Elimination by subtracting

$3x + y = 18$ and $5x + 2y = 14$. The y terms are opposites, so add the two equations straight down: $8x = 32$, so $x = 4$. Plug $x = 4$ back into either equation to get y .

The two special cases

$y = 2x + 5$ and $y = 2x + 14$. The y terms are the same, so subtract the two equations: $0 = 9$. No solution. (parallel lines).

Remember

- A solution is a pair, written (x, y) . It has to make both equations true, not just one. Always check it in both.
- Use substitution when one equation already says $x = \text{something}$ or $y = \text{something}$.
- Use elimination when the x terms or the y terms are the same size. Add if the signs are opposite, subtract if they match.
- Use elimination when one equation is a multiple of the other. Subtract if the signs are opposite, add if they match.
- Use elimination when one equation is a multiple of the other. Subtract if the signs are opposite, add if they match.
- No solution means the lines are parallel and you end up with a false statement like $0 = 7$. Infinitely many solutions means both equations are the same line and you end up with $0 = 0$.

Quick check

1. In (2, 3) is a solution of $4x - y = 5$ and $2x + y = 8$?
2. In (1, 4) is a solution of $2x + y = 6$ and $3x - y = 17$?
3. Solving substitution: $y = x + 2$ and $2x + y = 11$.
4. Solve by elimination: $x + y = 8$ and $x - y = 3$.

Challenge

Solve by substitution: $y = 3x - 7$ and $4x - 2y = 6$. Check your point in both equations.

Math set, Week 1 (solo)

Math Set 4: Practice

Sorten items in four blocks. Write the answer on the line, with a sign and a % sign.

A. Percent change (pay increase or decrease)

- From 20 to 25
- From 80 to 70
- From 150 to 105
- From 250 to 210

B. Markup, discounts and tax

- \$45 marked up 40%
- \$120 with 35% off
- \$70 marked up 20%, then 10% off
- \$25 plus 8% sales tax

C. Simple interest, $I = Prt$

- Interest: \$450 at 3% for 2 years
- Interest: \$1,500 at 6% for 4 years
- Total after 3 years: \$2,000 at 5%
- Rate: \$800 earns \$72 in 2 years

D. Compound growth

- \$100 at 10% for 3 years
- \$800 at 4% for 1 year
- \$1,000 at 10% for 3 years
- \$800 at 5% for 2 years

Challenge

\$1,000 grows 10% a year, compounded. Fill in the table. After how many full years has it doubled to \$2,000 or more?

Year	1	2	3	4	5	6	7	8
Value								

Double after how many full years?

Math practice, Week 2 (solo)

Math Set 5: Word Problems and Challenge

Use your problem. Then the star challenge. Switch the shape and/or the size of the shape, and keep the same on your answer.

- A boy is laying sod on a rectangular yard that is 10 feet by 12 feet. He has 120 square feet of sod. Find the area of the yard and the total cost.
- A cylinder water tank has a radius of 2 meters and a height of 5 meters. Find its volume to the nearest tenth of a cubic meter.
- A pizza has a diameter of 14 inches. Find its area to the nearest tenth, then find the area of one slice when it is cut into 8 equal pieces.
- A person walks 300 meters east, then 400 meters north. How much shorter is the straight walk back to his start than returning both ways?

Challenge

- A cylinder and a cone both have a radius of 6 cm and a height of 15 cm. Find both volumes with 3.14, then say what fraction of the cylinder the cone fits.
- A rectangular prism has a square base with edges of 5 inches and a volume of 300 cubic inches. Find its height, then find its surface area.
- A triangle has sides of 9 cm, 12 cm and 15 cm. Use the Pythagorean theorem to decide whether it is a right angle, then say what the longest side would have to be for it to be a right triangle.

Word problems + challenge (solo)

Calm Block, Day 2: Formula Words Match

Write the formula for the following meaning on the line. Use the formula words below. Write the formula words on the line. Use the formula words on the line. Use the formula words on the line.

Set Up the Task

Today's math is formula words. Read the four worked examples on page 1 first. Then, choose the one you want to solve. Write the answer as a point (x, y). Check if it is both equations, and try the other change on each page.

Formula Words Match

Terms	Meanings
1. formula	a. the temperature scale where water freezes at 0 degrees
2. isolate	b. put a number in place of a letter
3. inverse operation	c. a fraction flipped over, like 1/5 for 5/1
4. substitute	d. an amount for each unit of time, like 50 miles per hour
5. coefficient	e. a term with no variable, like the 7 in $7x + 7$
6. constant	f. get one letter alone on one side of the equals sign
7. rate	g. the distance all the way around a flat shape
8. perimeter	h. a step that undoes another, like dividing to undo multiplying
9. reciprocal	i. the number in front of a variable, like 3 in $3x$
10. Celsius	j. a rule like $A = B$ that connects measured quantities

How to start

- Use the pairs you are sure of first and cross off those others.
- Read each leftover meaning slowly and try to remember what it is.
- Every letter is used exactly once, so the last pair checks the rest.

Done early?

Put a few things down with one on an isotope, like $d = t$ and $t = d$.

Calm block: math puzzle (solo)

Calm Block, Day 4: Quiet Practice

Write the formula for the following meaning on the line. Use the formula words below. Write the formula words on the line. Use the formula words on the line.

Set Up the Task

Today's math is formula words. Read the four worked examples on page 1 first. Then, choose the one you want to solve. Write the answer as a point (x, y). Check if it is both equations, and try the other change on each page.

Formula Words Match

Terms	Meanings
1. formula	a. the temperature scale where water freezes at 0 degrees
2. isolate	b. put a number in place of a letter
3. inverse operation	c. a fraction flipped over, like 1/5 for 5/1
4. substitute	d. an amount for each unit of time, like 50 miles per hour
5. coefficient	e. a term with no variable, like the 7 in $7x + 7$
6. constant	f. get one letter alone on one side of the equals sign
7. rate	g. the distance all the way around a flat shape
8. perimeter	h. a step that undoes another, like dividing to undo multiplying
9. reciprocal	i. the number in front of a variable, like 3 in $3x$
10. Celsius	j. a rule like $A = B$ that connects measured quantities

How to start

- Use the pairs you are sure of first and cross off those others.
- Read each leftover meaning slowly and try to remember what it is.
- Every letter is used exactly once, so the last pair checks the rest.

Done early?

Put a few things down with one on an isotope, like $d = t$ and $t = d$.

Calm block: quiet practice (solo)

Team Task, Day 3: Tile Rectangle Builders

Groups of four. Use your problem. Then the star challenge. Switch the shape and/or the size of the shape, and keep the same on your answer.

Set Up the Task

Today's math is tile rectangle builders. For groups of four and about 15 minutes. Cut out the tiles, hold each tile with one side to the table, and the four side lengths are the factors. Read the example together first, so everyone knows what is expected, which is a challenge!

The task

Algebra tiles form factoring into a building grid. A big square is x^2 (by x by x), a long strip is x (by x by 1) and a small square is 1. Build each tile set below into one solid rectangle: no gaps, no overlaps, every tile used. The rectangle's area is the polynomial, so its two side lengths are the factors.

Worked example: $x^2 + 3x + 2$

1 big square, 3 strips and 2 small squares. Put the big square in a corner, strip along two sides, until it touches the top corner. Across the top, $x + 2$. Across the side, $x + 2$. So $x^2 + 3x + 2 = (x + 1)(x + 2)$.

Jobs and Time (40 minutes)

- 7 min Cut out the tiles and read the example.
- 10 min Build each tile set, one rectangle each.
- 7 min Record sides and factors, two people check.
- 4 min Design a set with no factors.
- 2 min Tidy the tiles.

Two builders, one recorder, one checker who multiplies every answer back out. Swap jobs after 10 min.

SET	TILES	POLYNOMIAL	BUILD YOUR RECTANGLE	SIDE LENGTHS	FACTORED FORM
1	1 x^2 , 5 x , 6	$x^2 + 5x + 6$			
2	1 x^2 , 8 x , 8	$x^2 + 8x + 8$			
3	2 x^2 , 7 x , 3	$2x^2 + 7x + 3$			
4	1 x^2 , 4 x , 4	$x^2 + 4x + 4$			
5	3 x^2 , 5 x , 2	$3x^2 + 5x + 2$			

Challenge

One of the four sets builds a rectangle, not just a rectangle. Which set is it, and what does that tell you about its factors?

Team task, Week 2 (groups of four)

Meet Your Sub

Day 1 opener. 10 minutes at the start of every period on Monday, before the first nothing to prepare.

Set Up the Task

Today's math is meet your sub. Read the four worked examples on page 1 first. Then, choose the one you want to solve. Write the answer as a point (x, y). Check if it is both equations, and try the other change on each page.

Sub script (the same five minutes in every class)

- 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 needs a sub to do ten minutes, so give them something to do.
- Introduce yourself from the sheet to two students. Then hold up the sub script and take three questions from named hands. Then, ten min. Say when you are done taking questions.
- Read the voice agreement out loud and ask this period to read one line of their own. Write that line on the board for the period. The first week is to be the first week.
- Set the voice level with a number from 1 to 3, using the box at the bottom of the sheet. Say when level today's set needs, and use the same sentence in every class at every time.
- Start the sub script with one sentence. This is today's math, everyone does the core task first, the star challenge is for anyone who finishes, and the calm block is always allowed.

If the room is loud

- Stop the questions. Keep the agreement and the voice level, and say the number out loud.
- Start the sub script. When the sub script has a speech about behavior every time.
- Name the level again after four rounds. A number is easier to follow than a lecture.

If a period runs ten minutes short

- Stop the questions. Keep the agreement and the voice level, and say the number out loud.
- Start the sub script. When the sub script has a speech about behavior every time.
- Name the level again after four rounds. A number is easier to follow than a lecture.

Monday checklist (before first period)

- Read the sub script introduction page, write the name, the teacher's name.
- Check the class list for allergies, medical needs, early releases and students who carry a pass.
- Find today's set of the weekly schedule and count copies for every period, plus five extras.
- Fill in the sub script. Your sub script needs one and good when the sub script can read 4.
- Write the voice levels to 3 on the board and leave them there all week.
- Keep the answer keys inside the binder, not face up on the desk.

Monday opener (whole class)

Game, Day 1: Whiteboard Quiz Game

Set up and run questions. 10 minutes at the start of every period on Monday, before the first nothing to prepare.

Set Up the Task

Today's math is whiteboard quiz game. Read the four worked examples on page 1 first. Then, choose the one you want to solve. Write the answer as a point (x, y). Check if it is both equations, and try the other change on each page.

Set up (2 minutes)

- Draw a 5 by 5 grid on the board (or tape up the board).
- Write the first category name across the top and the first value 100 to 500 down each column.
- Write the first category name across the top and the first value 100 to 500 down each column.
- Write the first category name across the top and the first value 100 to 500 down each column.

Read this out

"One voice per team gets a question to say the first answer. If the voice goes down to 1, the team is out and the game is over. If the team argues, the script goes to the next team on the board. If the team argues, the script goes to the next team on the board. If the team argues, the script goes to the next team on the board."

Play the game

- Read the question. The team answers. Right! They win the points and pass again. Wrong! The next team gets to read.
- Cross the square off. Highest total when time is up wins.

Evaluate

100 to 500: 1. Find 100. 2. Find 200. 3. Find 300. 4. Find 400. 5. Find 500.

Solve

100 to 500: 1. Find 100. 2. Find 200. 3. Find 300. 4. Find 400. 5. Find 500.

Graphs

100 to 500: 1. Find 100. 2. Find 200. 3. Find 300. 4. Find 400. 5. Find 500.

Tables

100 to 500: 1. Find 100. 2. Find 200. 3. Find 300. 4. Find 400. 5. Find 500.

Functions

100 to 500: 1. Find 100. 2. Find 200. 3. Find 300. 4. Find 400. 5. Find 500.

Game: Quiz Game (whole class)

Game, Day 3: Class Feud

Set up and run questions. 10 minutes at the start of every period on Monday, before the first nothing to prepare.

Set Up the Task

Today's math is class feud. Read the four worked examples on page 1 first. Then, choose the one you want to solve. Write the answer as a point (x, y). Check if it is both equations, and try the other change on each page.

Set up and play

- Set the room into two teams. Draw five numbered lines on the board, or tape up the board.
- Read out the first question. The team answers. Right! They win the points and pass again. Wrong! The next team gets to read.
- Read out the second question. The team answers. Right! They win the points and pass again. Wrong! The next team gets to read.
- Read out the third question. The team answers. Right! They win the points and pass again. Wrong! The next team gets to read.
- Read out the fourth question. The team answers. Right! They win the points and pass again. Wrong! The next team gets to read.
- Read out the fifth question. The team answers. Right! They win the points and pass again. Wrong! The next team gets to read.

Read this out

"One voice per team gets a question to say the first answer. If the voice goes down to 1, the team is out and the game is over. If the team argues, the script goes to the next team on the board. If the team argues, the script goes to the next team on the board. If the team argues, the script goes to the next team on the board."

Play the game

- Read the question. The team answers. Right! They win the points and pass again. Wrong! The next team gets to read.
- Read the second question. The team answers. Right! They win the points and pass again. Wrong! The next team gets to read.
- Read the third question. The team answers. Right! They win the points and pass again. Wrong! The next team gets to read.
- Read the fourth question. The team answers. Right! They win the points and pass again. Wrong! The next team gets to read.
- Read the fifth question. The team answers. Right! They win the points and pass again. Wrong! The next team gets to read.

Round 1, Q1: Name two numbers that multiply to 12

12: 1. 3 and 4. 2. 2 and 6. 3. 1 and 12. 4. 4 and 3. 5. 6 and 2.

Round 1, Q2: Name a factoring method

1. GCF. 2. Trial and error. 3. Synthetic division. 4. Factoring by grouping. 5. Factoring by substitution.

Round 1, Q3: Name a kind of polynomial

1. Monomial. 2. Binomial. 3. Trinomial. 4. Quadratic. 5. Cubic.

Round 1, Q4: Name a perfect square

1. 1. 2. 4. 3. 9. 4. 16. 5. 25.

Round 2, Q1: Name a factor of 24 and 36 (double)

1. 2. 2. 3. 3. 4. 4. 6. 6. 8. 8. 12. 12. 18. 18. 24. 24.

Round 2, Q2: Name a common factor of 24 and 36 (double)

1. 2. 2. 3. 3. 4. 4. 6. 6. 8. 8. 12. 12. 18. 18. 24. 24.

Round 2, Q3: Name a factor of 24 and 36 (double)

1. 2. 2. 3. 3. 4. 4. 6. 6. 8. 8. 12. 12. 18. 18. 24. 24.

Round 2, Q4: Name a common factor of 24 and 36 (double)

1. 2. 2. 3. 3. 4. 4. 6. 6. 8. 8. 12. 12. 18. 18. 24. 24.

Game: Class Feud (whole class)



Math Set 1: Function Notation

Read the four worked examples, then do the quick check. Show your work.

Math • Day 1

This set reviews: reading and using $f(x)$ notation: evaluate, solve $f(x) = k$, read tables and graphs, and decide if a relation is a function



SAY THIS TO THE CLASS

"Today's math is function notation, and you work on your own this period. Read the four worked examples first: $f(4)$ means put 4 in for x , and $f(x) = 11$ means find the input that gives 11. Show your work, and try the star challenge at the bottom of each page when you finish."

1 Evaluate

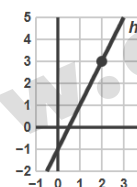
$f(x) = 3x - 4$. To find $f(4)$, replace every x with 4: $f(4) = 3(4) - 4 = 12 - 4$. For a negative input use parentheses: $f(-2) = 3(-2) - 4 = -6 - 4$.

$f(4) = 8$ and $f(-2) = -10$

2 Read a table and a graph

In the table, find 2 in the x row and read the number under it. On the graph of h , start at 2 on the x -axis and go up to the line, then read the height.

| x | 0 | 1 | 2 | 3 |
|--------|---|---|---|---|
| $g(x)$ | 6 | 4 | 2 | 0 |



$g(2) = 2$ and $h(2) = 3$

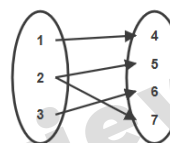
3 Solve $f(x) = 11$

Now the OUTPUT is given and you look for the input. Set the rule equal to 11: $3x - 4 = 11$. Add 4 to get $3x = 15$, then divide by 3. Check: $f(5) = 15 - 4 = 11$.

$x = 5$

4 Function or not?

A function gives each input exactly one output. In this mapping, the input 2 has two arrows, so it is not a function. On a graph, use the vertical line test: if any vertical line crosses the graph twice, it is not a function.



not a function

Remember

- $f(x)$ is read "f of x".** It is the output of the function f for the input x . It does NOT mean f times x .
- Evaluate:** the input is given, find the output. **Solve $f(x) = k$:** the output is given, find the input.
- Function:** every input has exactly one output. Two inputs may share an output; one input may not have two.

Quick check: four to try before the practice

1. $g(x) = 5x + 2$. Find $g(-3)$. _____

2. $g(x) = 5x + 2$. Solve $g(x) = 27$. _____

3. $k(x) = x^2 - 1$. Find $k(4)$. _____

4. Is $\{(1, 4), (2, 5), (1, 6)\}$ a function? (yes or no) _____



Challenge

$f(x) = 4x - 1$ and $g(x) = x^2 + 1$. Find $f(g(2))$, then $g(f(2))$. Work from the inside out.

$f(g(2)) =$ _____

$g(f(2)) =$ _____



Math Set 1: Practice

Sixteen items in four blocks. Write each answer on its line and show the work next to it.

Math • Day 1

A. Evaluate

1. $f(x) = 2x + 7$. Find $f(3)$.

2. $f(x) = 2x + 7$. Find $f(-5)$.

3. $g(x) = x^2 + 3x$. Find $g(2)$.

4. $g(x) = x^2 + 3x$. Find $g(-4)$.

B. Solve $f(x) = k$

1. $f(x) = 4x - 3$. Solve $f(x) = 25$.

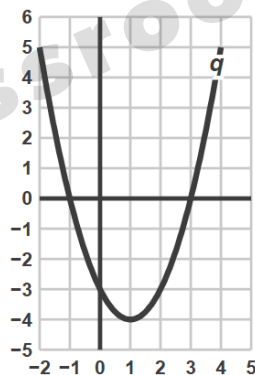
2. $f(x) = -2x + 9$. Solve $f(x) = 15$.

3. $f(x) = x/2 + 6$. Solve $f(x) = 10$.

4. $f(x) = x^2$. Solve $f(x) = 49$. (Two answers.)

C. Read the table of p and the graph of q

| x | -2 | -1 | 0 | 1 | 2 | 3 |
|--------|----|----|---|----|----|----|
| $p(x)$ | 7 | 4 | 1 | -2 | -5 | -8 |



1. $p(-2) = ?$

2. Solve $p(x) = -5$.

3. $q(1) = ?$

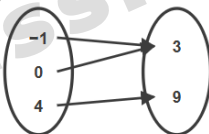
4. $q(x) = 0$ for which two x ?

D. Function or not? Write yes or no under each one.

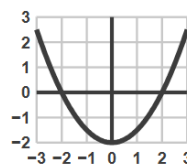
1

| x | 1 | 2 | 3 | 2 |
|-----|---|---|---|---|
| y | 5 | 6 | 7 | 8 |

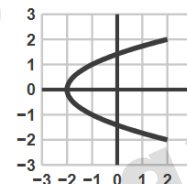
2



3



4




Challenge $f(x) = x^2 - 2x$. Find $f(3)$, then find the other number a with $f(a) = f(3)$.

$f(3) =$ _____

$a =$ _____



Math Set 1: Functions in Context

Six word problems. Write the function value or equation first, then answer in a sentence with units.

Math • Day 1

- 1 A taxi ride of m miles costs $f(m) = 3m + 5$ dollars. Find $f(8)$. Then find how many miles a \$41 ride was.

- 2 The cost of n concert tickets is $C(n) = 12n + 6$ dollars (a \$6 booking fee). Delia has \$90. What is the most tickets she can buy?

- 3 A plant is $h(w) = 2w + 9$ cm tall after w weeks. Find $h(5)$. In which week does it reach 25 cm?

- 4 $P(d)$ is the number of pages Bram has read after d days, and $P(5) = 32$. Say in words what $P(5) = 32$ means. If $P(d) = 6d + 2$, check that $P(5) = 32$.

- 5 The art club pays $C(n) = 0.5n + 10$ dollars to print n posters, and the printer takes at most 40. Which values of n make sense? What is $C(40)$?

- 6 An oven is $T(t) = 70 + 25t$ degrees F, t minutes after it is switched on. Find $T(4)$. After how many minutes is it 345 degrees F?

★ Challenge

- 1 A kayak rental costs $f(h)$ dollars for h hours, and f is linear. $f(2) = 31$ and $f(5) = 58$. Write $f(h)$. Rentals last 1 to 6 hours: what is a sensible domain?

- 2 Cyrus says the relation $x = y^2$ makes y a function of x . Find two points with $x = 4$ to show he is wrong.



Answer Keys (1 of 7)

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

Day 1 opener: Error Doctor

Case A: step 1. -2 times -4 is $+8$, so step 1 should be $5 - 2x + 8 = 3$. Then $-2x + 13 = 3$, $-2x = -10$, $x = 5$.

Case B: step 1. $(x + 5)^2 = (x + 5)(x + 5) = x^2 + 10x + 25$: the middle term $10x$ is missing. At $x = 2$: $4 + 20 + 25 = 49$, the same as 7^2 .

Case C: step 3. Slope is rise over run, not run over rise: $6 \div 3 = 2$. Check: from $(1, 2)$, going right 3 and up 6 lands on $(4, 8)$.

Math Set 1: Function Notation

Quick check: 1. -13 ; 2. $x = 5$; 3. 15 ; 4. no, the input 1 has two outputs.

Evaluate: 1. 13 ; 2. -3 ; 3. 10 ; 4. 4

Table and graph: 1. 7 ; 2. $x = 2$; 3. -4 ; 4. $x = -1$ and $x = 3$

Solve: 1. $x = 7$; 2. $x = -3$; 3. $x = 8$; 4. $x = 7$ or $x = -7$

Function or not: 1. no; 2. yes; 3. yes; 4. no (1: the input 2 has outputs 6 and 8; 4: a vertical line at $x = 1$ crosses twice)

Word problems: 1. $f(8) = \$29$; a $\$41$ ride was 12 miles; 2. 7 tickets ($C(7) = \$90$ exactly); 3. $h(5) = 19$ cm; week 8; 4. after 5 days, Bram has read 32 pages; $6(5) + 2 = 32$; 5. whole numbers from 0 to 40 (no fractions of a poster); $C(40) = \$30$; 6. $T(4) = 170$ degrees F; 11 minutes.

Challenge, page 1: $f(g(2)) = f(5) = 19$; $g(f(2)) = g(7) = 50$. The order matters. **Challenge, page 2:** $f(3) = 3$; $a = -1$ (solve $x^2 - 2x = 3$: $(x - 3)(x + 1) = 0$). **Challenge, page 3:** 1. $f(h) = 9h + 13$; domain $1 \leq h \leq 6$ (whole hours 1 to 6 also fine); 2. $(4, 2)$ and $(4, -2)$: the input 4 has two outputs.



Calm Block, Day 1: Word Search

Find all 12 terms from today's function lesson. Every direction, including backward. Pencils only, voices at 0.

Calm • Day 1



SAY THIS TO THE CLASS

"For this calm block, everyone works alone and silently, voices at zero. Page 1 is a word search with twelve words from today's function lesson, and page 2 has eight function problems with an answer bank. Do either page first, and check each answer in the bank as you go."

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

FUNCTION

EVALUATE

NOTATION

RELATION

MAPPING

OUTPUT

DOMAIN

INPUT

RANGE

VERTICAL

TABLE

RULE

Done early?

Pick three of the words. Write a short example of each one, like $f(3) = 7$ for a value.

.....

.....



Team Task, Day 2: Planning Sheet

Test at least three different plans. Show every total so another group could check your work.

Team • Day 2

| PLAN A | PLAN B | PLAN C |
|------------------------------|--------|--------|
| Features in the plan | | |
| Total area (max 1,000 sq ft) | | |
| Total cost (max \$10,500) | | |
| Both limits met? (yes / no) | | |
| Visitor points | | |

Our final plan

Features _____
 Area _____ Cost _____ Visitor points _____
 Area checked by _____ Cost checked by _____

Rule check (check all three)

- ☐ Area 1,000 sq ft or less
- ☐ Cost \$10,500 or less
- ☐ Every area uses the right formula and $\pi = 3.14$

The feature you left out

Name one feature your group wanted and could not fit.
 Which limit stopped you, the space or the money?

Value for money

Points per \$1,000 tells you which features are good value.
 Work it out for your two favorite features. Which one is the better deal?

Explain your plan in two sentences

Why is this plan better than the other two you tested? Use numbers, not opinions.

★ Challenge

The town buys the empty strip next door, so the park now has 1,200 sq ft of space. The budget stays \$10,500. Find the best plan now: which features, and how many visitor points?



Game, Day 1: The Board

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

Game • Day 1

| EVALUATE | SOLVE | TABLES | GRAPHS | FUNCTION? |
|----------|-------|--------|--------|-----------|
| 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

.....

.....

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Team 2

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Team 3

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Team 4

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Team 5

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Team 6

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Game, Day 2: Paper Password

Sub script and math word list. 15 minutes at the end of the period, or for extra time. Optional.

Game • Day 2



"To end the class, we can play Paper Password, an optional and fun word game for partners. Every secret word comes from today's lesson on formulas, and a word guessed with fewer clues scores more points."

Set up (2 minutes)

1. Pairs sit face to face. Give each pair one card page, cut into the four round cards (or folded so one card shows). Turn the cards you are not using face down.
2. Partner A is the clue giver in rounds 1 and 3, Partner B in rounds 2 and 4. The guesser never sees the card.
3. Each round lasts 2 minutes. The clue giver says ONE word. The guesser gets ONE guess. Wrong: give another one-word clue.
4. After five clues without a right guess, the word scores 0 and the pair moves on. Say "Go" and "Stop" for each round.

Read this out

"Your clue is one word only. You may not say the secret word or any part of it. If the word is snowman, you cannot say snow or man. No gestures, no spelling, no rhymes. Break a rule and that word scores zero."

Scoring: guessed on clue 1 = 5 points, clue 2 = 4, clue 3 = 3, clue 4 = 2, clue 5 = 1. The clue giver circles the number on the card. After round 4, pairs add their four round totals. Highest total wins; ask pairs to call out totals over 60.

Referee calls

Two words glued together ("hotdog") count as one clue only if they make a real single word. Plurals and "-ing" forms of the secret word are not allowed. If two pairs argue about a clue, the word scores zero and they move on. The example clues below are allowed and show students what a good first clue sounds like.

Timing (15 minutes)

0:00

Set up, rules

2:00

Round 1, Partner A

4:30

Round 2, Partner B

7:00

Round 3, Partner A

9:30

Round 4, Partner B

12:00

Add totals, winners

Round 1: Partner A gives clues

| | |
|-----------|---------------------------|
| FORMULA | example clue: rule |
| ISOLATE | example clue: solo |
| INVERSE | example clue: undo |
| REARRANGE | example clue: reorder |
| CELSIUS | example clue: temperature |

Round 3: Partner A gives clues

| | |
|----------|------------------------|
| DISTANCE | example clue: miles |
| VOLUME | example clue: capacity |
| INTEREST | example clue: bank |
| HEIGHT | example clue: tall |
| CONSTANT | example clue: fixed |

Round 2: Partner B gives clues

| | |
|---------|----------------------|
| SPEED | example clue: fast |
| TIME | example clue: hours |
| WIDTH | example clue: across |
| LENGTH | example clue: ruler |
| FENCING | example clue: garden |

Round 4: Partner B gives clues

| | |
|----------|-------------------------|
| LITERAL | example clue: variables |
| DIVIDE | example clue: split |
| SUBTRACT | example clue: minus |
| AVERAGE | example clue: mean |
| CYLINDER | example clue: can |



Game, Day 4: Classroom Millionaire

Sub script and the 12 questions. 15 minutes at the end of the period, or for extra time. Optional.

Game • Day 4



SAY THIS TO THE CLASS

"Classroom Millionaire is an optional, fun way to end the class, and the whole room climbs one ladder of twelve questions together. Every question is about today's percents, prices and interest, and the class shares three lifelines."

How it works

1. Tape up the ladder sheet. The whole class is one player. Pick a student for the hot seat (a new student for every question).
2. Read the question and the four options, then read the options again. The hot seat may listen to quiet advice, then says "final answer" and a letter.
3. Right: the class climbs one rung. Before hearing the next question, the class may vote to walk away and keep what it has.
4. Wrong: the climb ends. Rungs 4 and 8 are safe: the class keeps the last safe amount it passed.
5. Time left over? Play the questions again as a team quiz.

Three lifelines (one use each)

Ask the class: everyone shows 1, 2, 3 or 4 fingers at once for A, B, C or D. The hot seat looks, then decides.

50/50: read out the two wrong options listed under the question. Cross them off.

Phone a friend: the hot seat picks one classmate, who has 30 seconds to say what they think out loud.

"Only the hot seat's final answer counts. Shout an answer and the class loses a lifeline."

Rungs 1 to 4, rung 4 is safe

1. **\$100** What is 10% of 250?

A. 20 B. 2.5 C. 25 D. 250

Answer: C. 25 (50/50 removes A and D)

2. **\$250** Write 8% as a decimal.

A. 0.08 B. 0.8 C. 8.0 D. 0.008

Answer: A. 0.08 (50/50 removes B and C)

3. **\$500** A \$40 item is 25% off. Sale price?

A. \$10 B. \$15 C. \$35 D. \$30

Answer: D. \$30 (50/50 removes A and B)

4. **\$1,000** Which multiplier raises a price by 6%?

A. 0.94 B. 1.06 C. 1.6 D. 6

Answer: B. 1.06 (50/50 removes C and D)

Rungs 9 to 12

9. **\$50,000** Which multiplier takes 30% off a price?

A. 0.3 B. 0.7 C. 1.3 D. 0.03

Answer: B. 0.7 (50/50 removes C and D)

10. **\$100,000** A \$50 item is marked up 40%. New price?

A. \$54 B. \$90 C. \$20 D. \$70

Answer: D. \$70 (50/50 removes A and C)

11. **\$500,000** Total owed: \$1,000 at 4% simple for 5 years?

A. \$1,200 B. \$1,020 C. \$1,040 D. \$1,250

Answer: A. \$1,200 (50/50 removes B and D)

12. **\$1 MILLION** 20% off, then 20% off again. Total discount?

A. 40% B. 20% C. 36% D. 44%

Answer: C. 36% (50/50 removes A and B)

Rungs 5 to 8, rung 8 is safe

5. **\$2,500** A price goes from \$50 to \$60. Percent increase?

A. 10% B. 16% C. 60% D. 20%

Answer: D. 20% (50/50 removes B and C)

6. **\$5,000** Simple interest on \$200 at 5% for 3 years?

A. \$10 B. \$15 C. \$30 D. \$300

Answer: C. \$30 (50/50 removes A and D)

7. **\$10,000** A price drops from \$80 to \$60. Percent decrease?

A. 25% B. 20% C. 33% D. 75%

Answer: A. 25% (50/50 removes C and D)

8. **\$25,000** \$100 grows 10% a year, compounded. After 2 years?

A. \$120 B. \$121 C. \$110 D. \$200

Answer: B. \$121 (50/50 removes C and D)

If the class misses

Wrong on rung 1 to 4

class keeps \$0

Wrong on rung 5 to 8

class keeps \$1,000

Wrong on rung 9 to 12

class keeps \$25,000

Walk away after rung n

class keeps rung n



Math Set 2: Literal Equations and Formulas

Read the four worked examples, then do the quick check. Show every step.

Math • Day 2

This set reviews: solving a formula for one of its letters (one step, two steps, fractions, grouping), then using the new formula with numbers



"Today you rearrange formulas so a different letter stands alone, and you work on your own this period. Treat every other letter like a number and undo the operations in reverse order, just like solving for x . Show each step, and try the star challenge at the bottom of each page when you finish."

1 Distance, rate, time

Solve $d = rt$ for t . The t is multiplied by r , so undo it: divide both sides by r . Use it: a bus travels 150 miles at 50 mph, so $t = 150/50 = 3$ hours.

$$t = d/r$$

2 Perimeter of a rectangle

Solve $P = 2l + 2w$ for w . Subtract $2l$ from both sides: $P - 2l = 2w$. Then divide both sides by 2. Use it: $P = 30$ and $l = 9$ give $w = (30 - 18)/2 = 6$.

$$w = (P - 2l)/2$$

3 Slope-intercept form

Solve $y = mx + b$ for x . Treat the letters like numbers: subtract b , then divide by m . Use it: $y = 17$, $m = 3$ and $b = 2$ give $x = (17 - 2)/3 = 5$.

$$x = (y - b)/m$$

4 Temperature

Solve $C = (5/9)(F - 32)$ for F . Multiply both sides by $9/5$ to undo the $5/9$: $(9/5)C = F - 32$. Then add 32. Use it: $C = 25$ gives $F = 45 + 32 = 77$.

$$F = (9/5)C + 32$$

Remember

- **A literal equation has more than one letter.** To solve for one letter, every other letter acts like a number.
- **Work backward:** first remove what is added or subtracted, then what multiplies or divides. Parentheses: divide by the number outside, or multiply it through.
- **Fractions:** multiply both sides by the denominator, or by the reciprocal of a fraction like $5/9$.
- **Check:** pick easy numbers, put them in the old and the new formula, and make sure both agree.

Quick check: solve each formula for the letter named

1. $A = lw$, for l _____

2. $3x + y = 12$, for y _____

3. $I = Prt$, for r _____

4. $a = (b + c)/2$, for c _____



Challenge

The area of a trapezoid is $A = (1/2)h(b_1 + b_2)$. Solve for b_1 , then find b_1 when $A = 40$, $h = 5$ and $b_2 = 7$.

$$b_1 = \dots\dots\dots$$

$$\text{When } A = 40: b_1 = \dots\dots\dots$$

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