High School Math Maternity Leave Sub Plans, 6 Weeks

Six week binders of high school math, grades 9 to 12, any course. Every day has individual work and a team task; every task has a "say this" script.

PREVIEW

What is included

- Six week binders (68, 65, 65, 64, 64, 64 pages): 390 pages
- 78 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
- 60 solo blocks (30 math sets, 30 calm blocks) and 30 team tasks for groups of four
- A "say this to the class" script for all 126 tasks: 2 or 3 sentences the sub reads out
- A core task and a ★ challenge in every math set and team task
- 30 optional games, each on that day's lesson (Day 30: on all six weeks)
- Answer keys for everything; color and ink-saver B&W, US Letter and A4

How it works

1. Leave the six 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 30 days, 30 topics: a math set, a team task and a game each day

- **Week 1, days 1 to 5. Math:** Linear Equations and Inequalities, Slope and Graphing Lines, Systems of Equations, Exponents and Polynomials, Area, Volume and Right Triangles. **Team tasks:** Largest to Smallest, The Pocket Park Plan, Twenty Four Squares, The Fountain Arc, Calculator Debate.
- **Week 2, days 6 to 10. Math:** Function Notation, Literal Equations and Formulas, Factoring Polynomials, Percent Applications, Two-Way Tables and Relative Frequency. **Team tasks:** Vending Machine Audit, Formula Help Desk, Tile Rectangle Builders, Best Offer Rankings, Club Fair Survey Desk.
- **Week 3, days 11 to 15. Math:** Linear Functions from Tables, Graphs and Words, Absolute Value Equations and Inequalities, Solving Quadratics by Factoring and Square Roots, Similar Triangles and Scale, Compound Probability. **Team tasks:** Taxi Fare Detectives, Quality Control Line, Root Rummy, Classroom Floor Plan, Random Digit Lab.
- **Week 4, days 16 to 20. Math:** Exponential Growth and Decay, Radicals and Rational Exponents, The Quadratic Formula and Parabolas, Right Triangle Trigonometry, Scatter Plots, Best Fit and Correlation. **Team tasks:** Which Offer Wins, Radical Dominoes, Skate Ramp Designer, Height Finder Survey, Prediction Contest.
- **Week 5, days 21 to 25. Math:** Arithmetic and Geometric Sequences, Systems of Inequalities, Transformations of Functions, Circles: Arcs, Sectors and Equations, Standard Deviation and the Normal Curve. **Team tasks:** Tables, Cups, Frames and Folds, Bake Sale Planner, Transformation Relay, Pizza Shop Pricing, One-Minute Estimation Lab.
- **Week 6, days 26 to 30. Math:** Piecewise Functions, Distance and Midpoint, Angle Reasoning and Simple Proofs, Modeling with Functions, Big Review of Six Weeks. **Team tasks:** Parking Garage Audit, Tower Placement Plan, Proof Strip Puzzle, Business Plan Pitch, Six-Week Math Tournament.

Optional game every day, on that day's math lesson (Day 30, the big review day: its game reviews all six weeks): Mon **Whiteboard Quiz Game** Tue **Paper Password** Wed **Class Feud** Thu **Classroom Millionaire** Fri **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 390 pages.
What the sub gets: a note that explains the routine, a "say this" script for every task (126 in all), a sub script for every Monday opener, a "Read this out" box on most games, and every answer in the key.

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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. 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!

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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.

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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.

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 _____

Copier, if the sub may use it _____

Class routines

Start of class _____

Bathroom _____

Phones _____

End of class _____

Weekly Schedule (Blank)

Your own 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 ☆ challenges fill 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.

Class List and Dismissal

Names, what a sub must know, and how every student goes home. Copy one per class.

(B) bus (write the number) (W) walks (P) picked up (write who) (A) after-school program (O) other

☆ in the notes: a student who finds the core task easy 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				
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16				
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30				

How It Went

For the substitute. 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: _____

Meet Your Sub

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

Opener

SAY THIS TO THE CLASS

"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)

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 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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ONE PAGE OF EVERY DAILY PART

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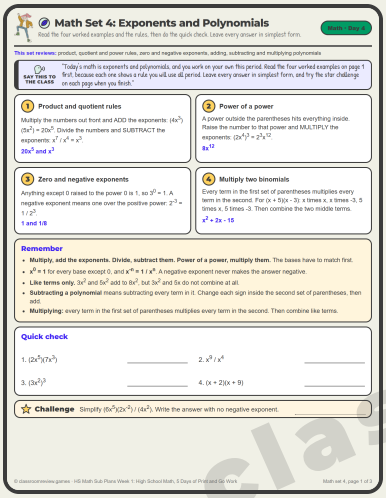
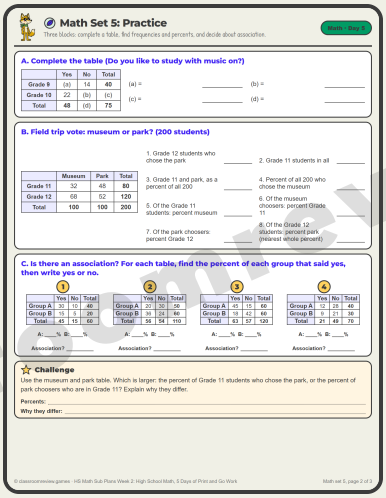
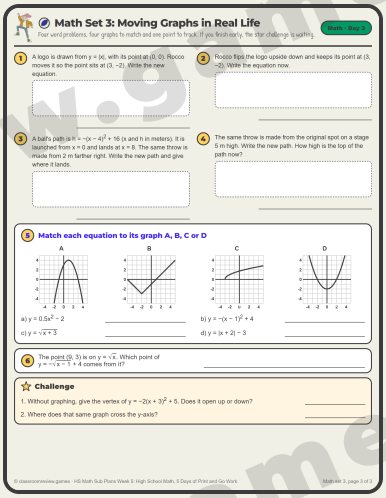


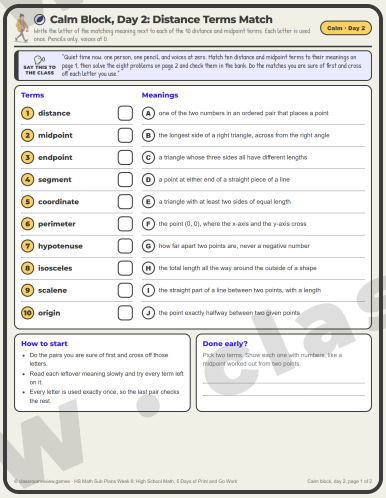
Math set, Week 1 (solo)



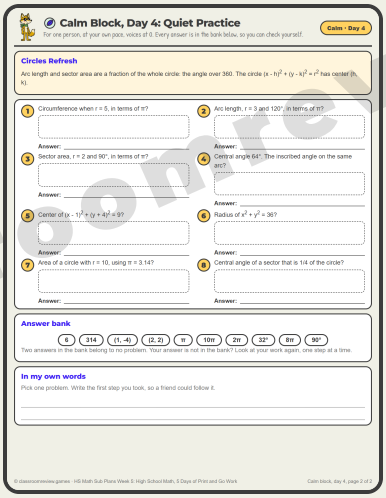
Math practice, Week 2 (solo)



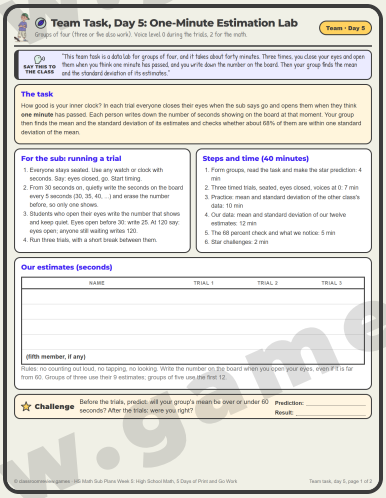
Word problems + challenge, Week 5 (solo)



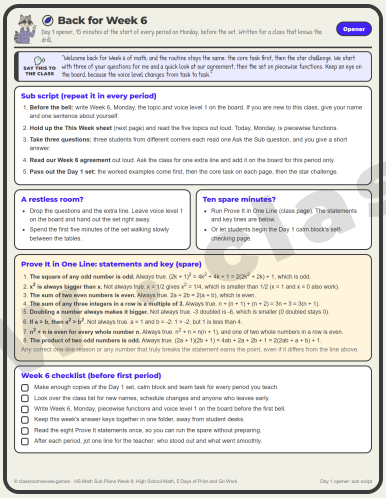
Calm block: math puzzle (solo)



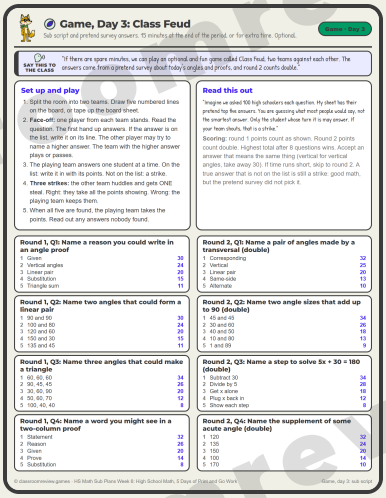
Calm block: quiet practice (solo)



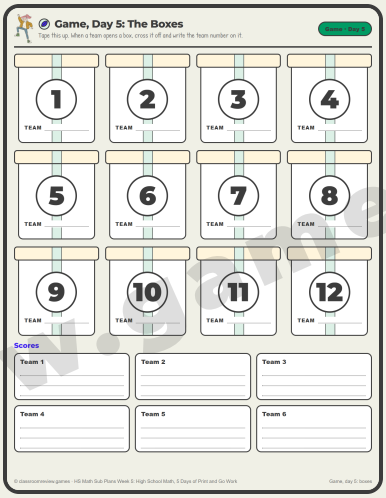
Team task, Week 5 (groups of four)



Monday opener, Week 6 (whole class)



Game: Class Feud (whole class)



Game: Mystery Box (whole class)

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Every day: a math set, a calm block, a team task and an optional game

Math Set 1: Piecewise Functions

Study the four worked examples, then try the quick check at the bottom. Keep your steps next to each answer.

Math · Day 1

This set reviews: evaluating piecewise functions, open and closed dots, step functions, absolute value in two pieces, writing piecewise rules from graphs and words

SAY THIS TO THE CLASS

"Today you work on your own on piecewise functions, functions made of different rules for different x values. For every input, first decide which piece it belongs to, then use only that rule. Read the four worked examples on page 1 before you start the quick check."

1 Evaluate: find the piece first

$$f(x) = \begin{cases} 2x + 1, & \text{if } x < 3 \\ 10 - x, & \text{if } x \geq 3 \end{cases}$$

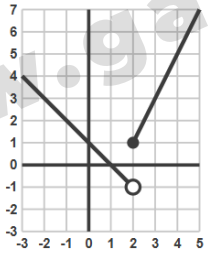
For f(1): 1 is less than 3, so use the top piece: 2(1) + 1. For f(3): 3 is not less than 3, so 3 belongs to the bottom piece: 10 - 3.

f(1) = 3 and f(3) = 7

2 Graph two pieces

$$g(x) = \begin{cases} -x + 1, & \text{if } x < 2 \\ 2x - 3, & \text{if } x \geq 2 \end{cases}$$

Draw each line only over its own interval. At x = 2 the top piece would give -1, but 2 is not in its interval: open dot. The bottom piece includes 2: closed dot at 2(2) - 3 = 1.



g(2) = 1 (closed dot), open dot at (2, -1)

3 A step function

$$S(w) = \begin{cases} 6, & \text{if } 0 < w \leq 1 \\ 9, & \text{if } 1 < w \leq 2 \\ 12, & \text{if } 2 < w \leq 3 \end{cases}$$

A courier charges by weight w in pounds. The cost stays flat inside each step and jumps at 1 and 2 pounds. A 2.4 lb box is over 2 and at most 3, so it is in the third step.

S(2.4) = $12

4 Absolute value as two pieces

$$|x + 1| = \begin{cases} x + 1, & \text{if } x \geq -1 \\ -x - 1, & \text{if } x < -1 \end{cases}$$

|x + 1| is x + 1 when x + 1 is 0 or more, and the opposite, -(x + 1), when it is negative. At x = -4: -4 is less than -1, so use -x - 1 = 4 - 1.

|-4 + 1| = 3

Key ideas: find the piece, then use it: each x belongs to exactly one piece. **< and >** leave the end out (open dot); **≤ and ≥** keep it (closed dot). Step functions stay flat and jump at the edges.

Quick check

$$h(x) = \begin{cases} x^2, & \text{if } x \leq 0 \\ 3x - 1, & \text{if } x > 0 \end{cases}$$

1. For h(x) above, find h(-3). _____

2. For h(x) above, find h(2). _____

3. Postage is $5 up to 2 lb and $8 over 2 lb up to 5 lb. What does a 3 lb box cost? _____

4. Evaluate |x| - 2 at x = -6. _____

Challenge f(x) = x + k if x < 2, and 3x - 1 if x ≥ 2. Find k so the two pieces meet at x = 2 (the graph has no jump). .....

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Math Set 1: Practice

Evaluate, read the graph, then write piecewise rules from graphs and from words. Answers go on the lines.

Math · Day 1

A. Evaluate

$$p(x) = \begin{cases} -2x, & \text{if } x < -1 \\ x^2 + 1, & \text{if } -1 \le x \le 2 \\ 9 - x, & \text{if } x > 2 \end{cases}$$

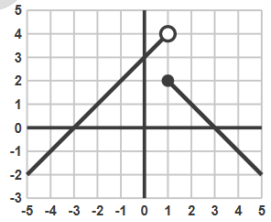
1. p(-3) _____

2. p(-1) _____

3. p(2) _____

4. p(6) _____

B. Read the graph of f



1. f(-2) _____

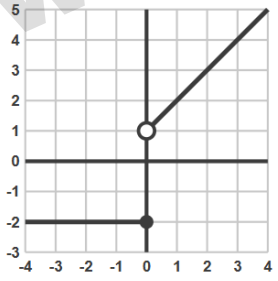
2. f(1) _____

3. f(4) _____

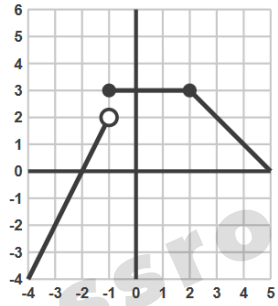
4. Solve f(x) = 0 _____

C. Write the function shown

Graph M



Graph N



Block C: write each piece with its condition, like y = 2x - 1 if x < 3. Every corner sits on grid points; each square is 1 unit. An open dot means that point is not on the graph.

D. Write the function from words

1. A climbing gym charges $30 a month for up to 10 visits and $3 for each visit after 10. Write the monthly cost C(v) for v visits, then find C(14).

2. A water bill is $2 per thousand gallons for the first 5 thousand gallons and $3 per thousand above that. Write B(g), g in thousands of gallons, then find B(8).

Challenge $f(x) = \begin{cases} 5, & \text{if } x \le 1 \\ 2x + 3, & \text{if } x > 1 \end{cases}$ For which x is f(x) = 5? Careful with 2x + 3 = 5. _____

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Math Set 1: Word Problems

Six problems where the rule changes partway. Decide which piece applies before you calculate. The star challenge is for early finishers.

Math · Day 1

1. A street parking meter charges $2 an hour for the first 3 hours and $4 an hour for each hour after that. What do 5 hours cost?

2. Vikram's phone plan is $35 a month with 10 GB of data, plus $6 for every GB over 10. He used 13 GB. What is his bill?

3. A shipper charges $4.50 for a box up to 1 lb, plus $1.50 for each extra pound or part of a pound. What does a 3.2 lb box cost?

4. In the invented country of Lumora, income up to $20,000 is taxed at 10%, and each dollar above $20,000 at 20%. What is the tax on $35,000?

5. Zofia's scooter rental costs $1 to unlock plus $0.25 a minute, but never more than $15. What does a 40 minute ride cost, and at what minute does the $15 cap start?

6. A 50 gallon tank drains 2 gallons a minute for 10 minutes, then the pump stops. Write A(t), the gallons left, for $0 \le t \le 30$, and find A(25).

Challenge

1. Write $|x - 2|$ as a piecewise function with two pieces. Name the x value where the pieces switch.

2. Use your pieces to solve $|x - 2| = 5$. Each piece gives one answer.

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Answer Keys (1 of 6)

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

Opener: Prove It in One Line

1. always true; 2. not always true; 3. always true; 4. always true; 5. not always true; 6. not always true; 7. always true; 8. always true. The full key lines are on the opener sub script page. Score: 2 points per statement, 16 in all.

Math Set 1: Piecewise Functions

Quick check: 1. 9; 2. 5; 3. $8; 4. 4. **Challenge, page 1:** k = 3 (the left piece must reach 3(2) - 1 = 5 at x = 2, so 2 + k = 5).

A. Evaluate: 1. 6; 2. 2; 3. 5; 4. 3. **B. Graph:** 1. 1; 2. 2; 3. -1; 4. x = -3 or x = 3 (f(1) = 2 is the closed dot; the open dot at (1, 4) is not on the graph).

C. Graphs: Graph M: y = -2 if x ≤ 0; y = x + 1 if x > 0. Graph N: y = 2x + 4 if x < -1; y = 3 if -1 ≤ x ≤ 2; y = -x + 5 if x > 2. Accept the same pieces in any order, and y = 3 written as a constant piece.

D. Words: 1. C(v) = 30 if 0 ≤ v ≤ 10; C(v) = 30 + 3(v - 10) if v > 10; C(14) = 42. 2. B(g) = 2g if 0 ≤ g ≤ 5; B(g) = 10 + 3(g - 5) if g > 5; B(8) = 19. Accept any form that gives the same values, such as 3v for 30 + 3(v - 10) and 3g - 5 for 10 + 3(g - 5).

Challenge, page 2: every x ≤ 1 (2x + 3 = 5 gives x = 1, which is not in the bottom piece).

Word problems: 1. $14 (6 + 4 × 2); 2. $53 (35 + 6 × 3); 3. $9.00 (3.2 lb is 3 started pounds past the first); 4. $5,000 (2,000 + 0.2 × 15,000); 5. $11; the cap starts at 56 minutes; 6. A(t) = 50 - 2t if 0 ≤ t ≤ 10, and 30 if 10 < t ≤ 30; A(25) = 30.

Challenge, page 3: 1. x - 2 if x ≥ 2, and 2 - x if x < 2; they switch at x = 2; 2. x = 7 (from x - 2 = 5) or x = -3 (from 2 - x = 5).

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Calm Block, Day 1: Word Search

Find all 12 sequence words. Every direction, including backward. Pencils only, voices at 0.

Calm · Day 1

SAY THIS TO THE CLASS "Calm block time: work by yourself, and keep voices at zero. Page 1 is a word search with twelve sequence words, and page 2 has eight sequence problems. Every page 2 answer is in the bank at the bottom, so you can check your own work."

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

SEQUENCE · TERM · RATIO · EXPLICIT · STAGE · COMMON · NEXT · POSITION · MULTIPLY · BOUNCE · GROWING · ADDING

Done early?

Pick three of the words. Write a short example of each one, like 3, 7, 11, 15 for a pattern that adds 4.

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Team Task, Day 2: The Search and the Plan

For each number of cornbread trays, find the most trays of twists that still fit every limit.

Team · Day 2

TRAYS OF CORNBREAD (X)	MOST TRAYS OF TWISTS (Y)	WHICH LIMIT STOPS ONE MORE TRAY OF TWISTS?	MONEY RAISED R
0			
1			
2			
3			
4			
5			
6			
7			
8			

Our best plan

Trays of cornbread _____ Trays of twists _____

Money raised _____

Check all three limits for this plan:

_____

_____

Shopping list

What do the ingredients for the best plan cost? How many cups of flour and minutes of oven time are left over?

_____

_____

_____

Note to the club

Write two sentences for the club: the plan, and one number that shows why it is the best.

_____

_____

Challenge A parent gives the club $12 more for ingredients (a $60 limit). Does the best plan change? Give the new plan and the money it raises.

New plan: _____

Raised: _____

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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

EVALUATE	GRAPHS	WRITE IT	STEPS	REAL RATES
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

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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

SAY THIS TO THE CLASS "If there is time, we finish with Paper Password, an optional game for pairs. The secret words come from today's inequalities and the bake sale task, and fewer clues means 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 about 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 partners disagree 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	2:00	4:30	7:00	9:30	12:00
Set up, rules	Round 1, Partner A	Round 2, Partner B	Round 3, Partner A	Round 4, Partner B	Add totals, winners

Round 1: Partner A gives clues

SHADE	example clue: color
REGION	example clue: area
DASHED	example clue: broken
SOLID	example clue: unbroken
ABOVE	example clue: over

Round 2: Partner B gives clues

CORNER	example clue: vertex
OVERLAP	example clue: share
LIMIT	example clue: cap
PLAN	example clue: strategy
STRICT	example clue: harsh

Round 3: Partner A gives clues

FEASIBLE	example clue: doable
GREATER	example clue: bigger
SOLUTION	example clue: answer
TEST	example clue: check
SKETCH	example clue: draw

Round 4: Partner B gives clues

OVEN	example clue: bake
FLOUR	example clue: wheat
TRAY	example clue: pan
RECIPE	example clue: cookbook
SEARCH	example clue: hunt

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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 "With any time left, the class can try Classroom Millionaire together, an optional game just for fun. The whole class climbs one ladder of twelve questions on today's modeling with functions, with a new student in the hot seat each time."

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 Equal first differences mean which model?
A. Linear B. Quadratic C. Exponential D. None
Answer: A. Linear (50/50 removes C and D)

2. $250 Equal ratios between values mean which model?
A. Linear B. Quadratic C. Constant D. Exponential
Answer: D. Exponential (50/50 removes A and C)

3. $500 Equal second differences mean which model?
A. Exponential B. Linear C. Quadratic D. Step
Answer: C. Quadratic (50/50 removes B and D)

4. $1,000 $y = 4x + 3$. What is y at x = 5?
A. 20 B. 23 C. 27 D. 35
Answer: B. 23 (50/50 removes C and D)

Rungs 5 to 8, rung 8 is safe

5. $2,500 Table 6, 12, 24, 48. What is the next value?
A. 96 B. 60 C. 72 D. 54
Answer: A. 96 (50/50 removes B and D)

6. $5,000 Table 3, 5, 9, 15, 23. Which model fits?
A. Linear B. Exponential C. Neither D. Quadratic
Answer: D. Quadratic (50/50 removes A and C)

7. $10,000 Revenue $R = p(50 - 2p)$. What is R at p = 10?
A. 500 B. 200 C. 300 D. 100
Answer: C. 300 (50/50 removes A and D)

8. $25,000 $y = 5(2)^x$. What is y at x = 4?
A. 80 B. 40 C. 160 D. 625
Answer: A. 80 (50/50 removes B and D)

Rungs 9 to 12

9. $50,000 $h = 40 - 5t$. Up to what t does it make sense?
A. 5 B. 35 C. 8 D. 40
Answer: C. 8 (50/50 removes A and D)

10. $100,000 Which price p gives the most revenue, $R = p(80 - 4p)$?
A. $20 B. $10 C. $40 D. $5
Answer: B. $10 (50/50 removes A and C)

11. $500,000 Sales = 200 - 20p at price p. Sales at $6?
A. 120 B. 60 C. 180 D. 80
Answer: D. 80 (50/50 removes B and C)

12. $1 MILLION $R = p(90 - 3p)$. What is the most revenue possible?
A. $450 B. $1,350 C. $675 D. $900
Answer: C. $675 (50/50 removes B 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**

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Math Set 2: Distance and Midpoint

Go through the four worked examples first, then the quick check below them. Show each step.

Math · Day 2

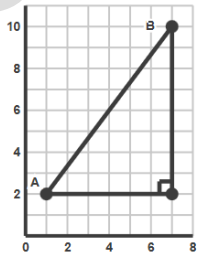
This set reviews: the distance formula from the Pythagorean theorem, midpoints, missing endpoints, perimeter on a grid and classifying triangles by their sides

SAY THIS TO THE CLASS

"Today you work on your own on distance and midpoint in the coordinate plane. For a distance, find how far across and how far up, then use the Pythagorean theorem; for a midpoint, average the x values and the y values. Read the four worked examples on page 1 before you begin."

1 Distance: a right triangle on the grid

From A(1, 2) to B(7, 10): across 7 - 1 = 6, up 10 - 2 = 8. AB is the hypotenuse: $AB^2 = 6^2 + 8^2 = 100$. That is the distance formula $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$.



AB = 10

2 Midpoint: average the coordinates

For (-3, 4) and (5, -2): the middle x is (-3 + 5) / 2 = 1, the middle y is (4 + -2) / 2 = 1. The midpoint is exactly halfway along the segment.

midpoint (1, 1)

3 Perimeter of a polygon on the grid

Corners (0, 0), (3, 4), (8, 4), (5, 0). Slanted sides: 3 across and 4 up give 5. The flat sides are 5 long too. Add all four sides.

perimeter 20 units (a rhombus)

4 Classify a triangle by its sides

(1, 1), (4, 5), (7, 1): the sides are 5, 5 and 6. Two equal sides make a triangle isosceles; three, equilateral; none, scalene.

isosceles

Two formulas

- **Distance:** $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$. Subtract in the same order for x and for y; squaring makes the sign stop mattering.
- **Midpoint:** $((x_1 + x_2) / 2, (y_1 + y_2) / 2)$. Missing endpoint: B = 2M - A, for x and y separately.

Quick check

1. Distance from (2, 3) to (2, 11) _____
2. Distance from (-1, -2) to (4, 10) _____
3. Midpoint of (6, -4) and (-2, 8) _____
4. Midpoint of (0, 7) and (9, 1) _____

Challenge Quadrilateral A(1, 1), B(6, 2), C(8, 6), D(3, 5): find the midpoints of the diagonals AC and BD. What do they show?

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