

CHAPTER 01

Algebra I

Algebra foundations, equations and functions

Classes 1-6 . October 13-29, 2026
Tuesdays and Thursdays . 6:00-7:00 PM Central

EVERY VALID STEP HAS A REASON

$$3x + 7 = 22$$

Start with an equation.

$$3x = 15$$

Subtract 7 from both sides.

$$x = 5$$

Divide both sides by 3.

Clear explanations . Worked examples . Accurate diagrams
Short practice checks . Worked answers . Chapter revision

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Your route through Chapter 1

Use the lesson for your next class, or open the topic you want to revisit. Each lesson includes explanations, examples, short checks and worked answers.

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LESSON 1 | MEET THE IDEA

Expressions, substitution and equivalent forms

Tuesday, October 13, 2026 . 6:00–7:00 PM Central

By the end, I can...
Replace a variable with a value, follow the order of operations, and write a simpler expression with the same value.

An **expression** is a mathematical phrase, such as $3x + 7$. It has no equals sign. A letter stands for a number; its value can change.

Word	What it means
Variable	A letter representing a number, such as x .
Coefficient	The number multiplying a variable: 3 in $3x$.
Term	A part separated by addition or subtraction; keep its sign.
Constant	A number with no variable attached: 7 here.

3x

|

variable term

+

7

|

constant term

3 is the coefficient: $3x$ means $3 \times x$.

Quick refresher: $3 \times (-2) = -6$. Adding 7 then gives 1. Parentheses help keep a negative value together.

LESSON 1 | WORKED EXAMPLES

Substitute, then calculate

To **evaluate** an expression, replace every copy of the variable with its given value. Put negative values in parentheses.

Example 1 | Evaluate $3x + 7$ when $x = -2$

$$3(-2) + 7$$

Replace x with (-2) .

$$-6 + 7$$

Multiply before adding.

$$1$$

Now add. The value of the expression is 1.

Example 2 | Evaluate $2a^2 - 3b$ when $a = -3$ and $b = 4$

$$2(-3)^2 - 3(4)$$

Replace both variables.

$$2(9) - 12$$

Square (-3) and multiply 3 by 4.

$$18 - 12 = 6$$

Complete the multiplication, then subtract.

The exponent acts on (-3) because the negative value is inside parentheses.

Use this order

Grouping symbols first; then exponents; then multiplication and division from left to right; finally addition and subtraction from left to right.

Watch the difference: $(-3)^2 = 9$, but $-3^2 = -(3^2) = -9$. The position of the parentheses matters.

LESSON 1 | DISTRIBUTE AND SIMPLIFY

Make an equivalent expression

Equivalent expressions have the same value for every allowed value of the variable. Distributing multiplies **each** term inside the parentheses.



$$3(x + 4) = 3x + 12$$

The rectangle models positive lengths. The rule $3(x + 4) = 3x + 12$ also works when x is zero or negative.

Example 3 | Simplify $-2(3x - 4) + 5x$

$$-6x + 8 + 5x$$

Multiply both $3x$ and -4 by -2 .

$$(-6 + 5)x + 8$$

Combine the x -terms.

$$-x + 8$$

The coefficient -1 is usually written as just a minus sign.

Combine only like terms

$3x + 2x = 5x$, but $3x + 2$ cannot become $5x$. A variable term and a constant describe different things.

In real life: a club charges \$8 to join and \$3 per visit. For n visits, the cost is $8 + 3n$ dollars. At $n = 4$, the cost is $8 + 12 = \text{\$20}$.

LESSON 1 | SHORT CHECKS

Your turn

Try these before reading the next page. Show a useful line of working. These are quick understanding checks; your main homework is in digital practice.

1. Evaluate $4x - 3$ when $x = -2$.

2. Simplify $2(x + 5) + 3x$.

3. Simplify $-3(2a - 4) + a$.

4. A craft club charges \$6 to join and \$2 per session. Write the cost for n sessions, then find the cost of 5 sessions.

5. A student says $3x + 2 = 5x$ for every x . Use $x = 2$ to show whether the claim is correct.

Before you move on

Have you used parentheses for negative substitutions? Have you multiplied every term in a bracket? Have you combined only like terms?

LESSON 1 | WORKED ANSWERS AND RECAP

Check your thinking

1. $4(-2) - 3 = -8 - 3 = -11$. Multiply first; then subtract 3.
2. $2(x + 5) + 3x = 2x + 10 + 3x = 5x + 10$. The 2 multiplies both x and 5.
3. $-3(2a - 4) + a = -6a + 12 + a = -5a + 12$. A negative times a negative gives a positive.
4. Cost = $6 + 2n$ dollars. At $n = 5$: $6 + 2(5) = \$16$. The \$6 fee is paid once.
5. At $x = 2$, $3x + 2 = 8$ but $5x = 10$. Since the values differ, the expressions are **not equivalent**. One counterexample disproves “for every x .”

The three moves to remember

Substitute: replace the letter carefully.

Distribute: multiply every term inside the bracket.

Combine: collect terms with the same variable part.

I can...

- ☐ Evaluate an expression with a negative input.
- ☐ Explain why two expressions are equivalent.
- ☐ Check a simplification by trying a value.

Next class: use equivalent steps to solve equations. Curriculum focus: TEKS A.10D. These are original Cambridge Veritas learning notes.

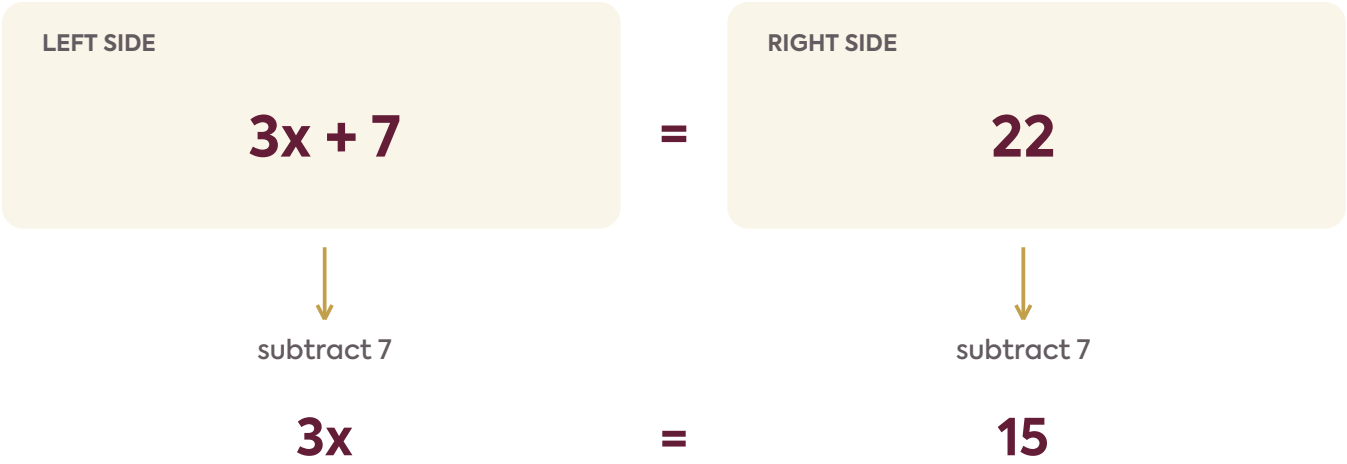
LESSON 2 | MEET THE IDEA

Solving multi-step linear equations

Thursday, October 15, 2026 . 6:00–7:00 PM Central

By the end, I can...
Solve equations with brackets, fractions or variables on both sides, check my solution, and recognize when there is no single solution.

An **equation** states that two expressions are equal. A **solution** is a value that makes the original statement true. Keep the two sides equal by doing the same valid operation to both.



Operation	The operation that undoes it
Add 7	Subtract 7.
Multiply by 3	Divide by 3.
Divide by 4	Multiply by 4.

Remember: division by zero is never a valid step. After solving, substitute into the original equation, not only the last simplified line.

LESSON 2 | WORKED EXAMPLES

Solve one step at a time

Example 1 | Solve $3x + 7 = 22$

$$3x + 7 - 7 = 22 - 7$$

Subtract 7 from both sides.

$$3x = 15$$

Simplify.

$$x = 5$$

Divide both sides by 3.

Check: $3(5) + 7 = 22$, so $x = 5$ is correct.**Example 2 | Solve $2(x + 3) + 4 = 3x + 1$**

$$2x + 6 + 4 = 3x + 1$$

Distribute the 2.

$$2x + 10 = 3x + 1$$

Combine the constants.

$$10 = x + 1$$

Subtract $2x$ from both sides.

$$x = 9$$

Subtract 1 from both sides.

Check: the left side is $2(9 + 3) + 4 = 28$; the right side is $3(9) + 1 = 28$.**A reliable route**

Simplify each side first. Collect variable terms on one side. Collect constants on the other. Undo the remaining multiplication or division. Check the original equation.

LESSON 2 | LOOK BEYOND ONE ANSWER

Fractions and special cases

Example 3 | Solve $(\frac{3}{4})x - 2 = 7$

$(\frac{3}{4})x = 9$	Add 2 to both sides.
$x = 9 \times (\frac{4}{3})$	Multiply both sides by the reciprocal $\frac{4}{3}$.
$x = 12$	Check: $(\frac{3}{4})(12) - 2 = 9 - 2 = 7$.

What remains after simplifying	What it tells you
$x = 5$	One solution: one value makes the statement true.
$6 = 6$	An identity: every real x works for this linear equation.
$-3 = 4$	A contradiction: no x works.

Infinitely many solutions: $2(x + 3) = 2x + 6$ simplifies to $2x + 6 = 2x + 6$, then $6 = 6$.

No solution: $3(x - 1) = 3x + 4$ simplifies to $3x - 3 = 3x + 4$, then $-3 = 4$.

What if the x -terms disappear?

Read the statement that remains. A true statement means every real x works; a false statement means there is no solution. Do not automatically write $x = 0$.

Check in context: $6 + 2m = 2 + 3m$ models two trip prices. It gives $m = 4$ miles, when both prices are \$14.

LESSON 2 | SHORT CHECKS

Your turn

Show equivalent steps. For Questions 1–3, substitute your answer back into the original equation.

1. Solve $5x - 4 = 16$.

2. Solve $3(x - 2) = 2x + 5$.

3. Solve $x/3 + 2 = 5$.

4. Solve $4(x + 1) = 4x + 4$. Explain what your final statement means.

5. Solve $2(x + 3) = 2x + 9$. Explain what your final statement means.

Common mistake

In $3(x - 2)$, the 3 multiplies both terms: $3x - 6$. Writing $3x - 2$ changes the equation.

LESSON 2 | WORKED ANSWERS AND RECAP

Check your thinking

1. $5x - 4 = 16$ gives $5x = 20$, so $x = 4$. Check: $5(4) - 4 = 16$.
2. $3x - 6 = 2x + 5$ gives $x - 6 = 5$, so $x = 11$. Both original sides equal 27.
3. $x/3 = 3$, so $x = 9$. Check: $9/3 + 2 = 5$.
4. $4x + 4 = 4x + 4$ reduces to $4 = 4$. There are **infinitely many solutions: all real numbers**.
5. $2x + 6 = 2x + 9$ reduces to $6 = 9$. This is false, so there is **no solution**.

A solution is a value, not just a final line

The value must make the **original** equation true. Checking both sides also catches errors made when distributing or working with a negative sign.

I can...

- ☐ Keep an equation balanced through each step.
- ☐ Handle a variable on both sides and a fractional coefficient.
- ☐ Distinguish one, no and infinitely many solutions.

Next class: rearrange formulas to make a chosen variable the subject. Curriculum focus: TEKS A.5A.

LESSON 3 | MEET THE IDEA

Rearranging formulas and literal equations

Tuesday, October 20, 2026 . 6:00–7:00 PM Central

By the end, I can...

Rearrange a formula to isolate a chosen letter, explain each operation, and state when a denominator cannot be zero.

A **formula** connects quantities. In $A = lw$, the area A depends on the length l and width w . A **literal equation** has more than one letter. We can rearrange it using the same balanced steps as a numerical equation.

Your job	How to think about it
Choose the subject	The subject is the letter you want alone on one side.
Treat other letters as quantities	If you are finding w , undo what is happening to w .
Keep the relationship true	Do the same valid operation to both sides.
Check restrictions	You cannot divide by a quantity that is zero.

A first rearrangement | Make w the subject of $A = lw$

$$A / l = lw / l$$

Divide both sides by l , assuming $l \neq 0$.

$$w = A / l$$

The factor l cancels on the right.

If $A = 24$ square units and $l = 6$ units, $w = 24/6 = 4$ units.

Say it aloud: “The width is the area divided by the length.” A formula should make sense in words as well as symbols.

LESSON 3 | WORKED EXAMPLES

Undo operations in reverse order

Example 1 | Make w the subject of $P = 2l + 2w$

$$P - 2l = 2w$$

Subtract $2l$ from both sides.

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

Divide the whole remaining expression by 2.

$$w = P/2 - l$$

An equivalent simplified form.

Check: if $P = 30$ and $l = 9$, then $w = (30 - 18)/2 = 6$. The perimeter is $2(9) + 2(6) = 30$.

Example 2 | Make C the subject of $F = (9/5)C + 32$

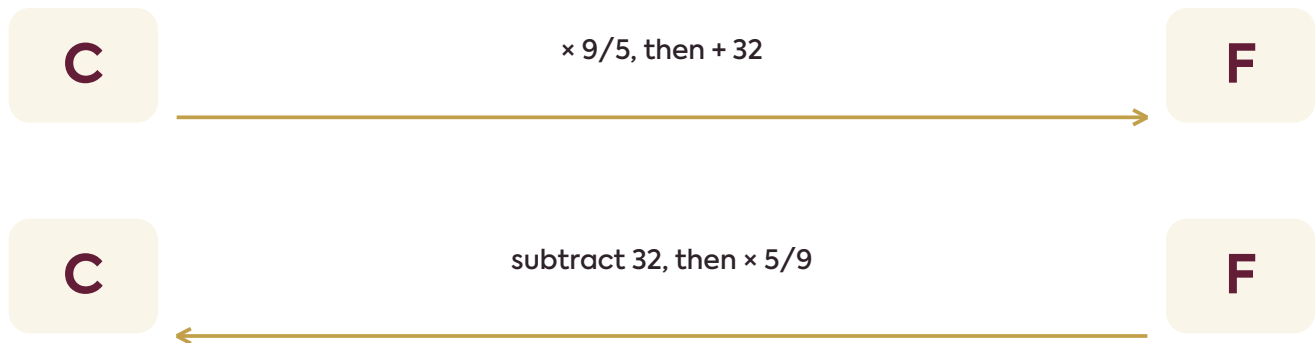
$$F - 32 = (9/5)C$$

Undo the addition of 32 first.

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

Multiply the whole side by the reciprocal $5/9$.

At $F = 68^\circ\text{F}$: $C = (5/9)(68 - 32) = (5/9)(36) = 20^\circ\text{C}$.



The return journey reverses the order: subtract 32 first, then multiply by $5/9$. Multiplying F alone by $5/9$ would leave out part of the expression.

LESSON 3 | TWO USEFUL PATTERNS

A letter in a denominator

Example 3 | Make t the subject of $v = d/t$

$$vt = d$$

Multiply both sides by t . The original formula needs $t \neq 0$.

$$t = d/v$$

Divide both sides by v , assuming $v \neq 0$.

For $d = 120$ miles and $v = 40$ miles per hour, $t = 120/40 = 3$ hours.

A condition is part of the answer

The rearranged formula $t = d/v$ requires $v \neq 0$. If v is zero, return to the original relationship; division by zero cannot tell you the time.

Example 4 | Make x the subject of $y = ax + bx$

$$y = (a + b)x$$

Factor out the x that appears in both terms.

$$x = y / (a + b)$$

Divide by the whole coefficient, assuming $a + b \neq 0$.

Check with $a = 2$, $b = 3$ and $y = 20$: $x = 20/5 = 4$, and $2(4) + 3(4) = 20$.

If $a + b = 0$: the original equation becomes $y = 0$. If $y = 0$, every real x works; if $y \neq 0$, no x works. The divided formula does not cover those cases.

Common mistake

$(P - 2I)/2$ means divide **both** terms by 2. It equals $P/2 - I$, not $P - I$.

LESSON 3 | SHORT CHECKS

Your turn

Make the requested letter the subject. Keep brackets around a whole numerator or denominator when needed.

1. $A = bh$. Make h the subject. State the restriction on b .

2. $P = 2l + 2w$. Make l the subject.

3. Use $C = (5/9)(F - 32)$ to convert 95°F to degrees Celsius.

4. $d = rt$. Make t the subject and state the restriction on r . Then find t when $d = 150$ miles and $r = 50$ miles per hour.

5. $y = ax + bx$. Make x the subject. Explain why the denominator needs brackets and cannot equal zero.

Checking tip: try simple values in both the original and rearranged formula. A numerical check can reveal a mistake; the balanced algebra explains why the rearrangement works.

LESSON 3 | WORKED ANSWERS AND RECAP

Check your thinking

1. Divide both sides by b : $h = A/b$, with $b \neq 0$.
2. $P - 2w = 2l$, so $l = (P - 2w)/2 = P/2 - w$. The entire difference is divided by 2.
3. $C = (5/9)(95 - 32) = (5/9)(63) = 35^\circ\text{C}$. Subtract before multiplying.
4. $t = d/r$, with $r \neq 0$. For the given values, $t = 150/50 = 3$ hours.
5. Factor first: $y = (a + b)x$. Then $x = y/(a + b)$, with $a + b \neq 0$. The whole sum is the coefficient of x , so divide by the whole sum.

A rearrangement keeps the same relationship

Choose the target letter. Undo operations in reverse order. If it appears twice, look for a common factor. State the conditions needed for any division.

I can...

- ☐ Explain which letter I am isolating and why.
- ☐ Rearrange a formula before substituting numbers.
- ☐ State and interpret a nonzero-denominator condition.

Next class: investigate when an input-output relationship is a function. Curriculum focus: TEKS A.12E.

LESSON 4 | MEET THE IDEA

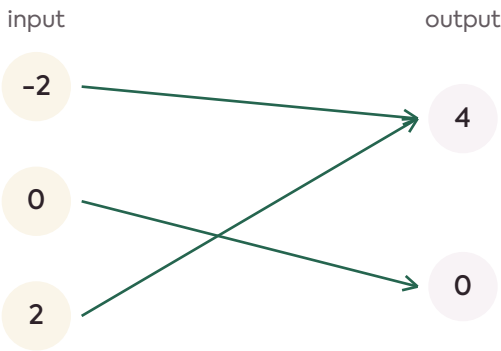
Relations, functions and function notation

Thursday, October 22, 2026 . 6:00–7:00 PM Central

By the end, I can...
Decide whether a relationship is a function and find an output using a rule, table, graph or mapping.

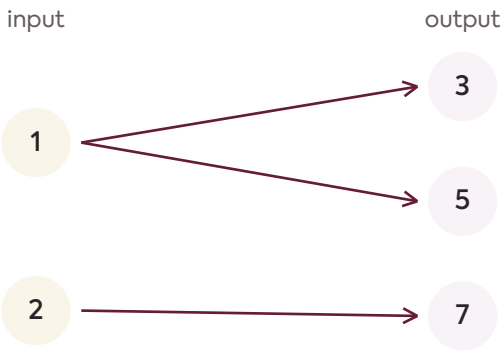
A **relation** connects inputs and outputs. A **function** gives exactly **one output for each input** in its domain. Different inputs are allowed to share the same output.

FUNCTION



Different inputs may share an output.

NOT A FUNCTION



Input 1 has two different outputs.

Word or symbol	Meaning
Input / output	The value you start with / the value the rule gives back.
Ordered pair (x, y)	Input x comes first; output y comes second.
f(x)	The output of the function f at input x. Say “f of x.”

Notice: the left mapping has two inputs that lead to 4. That is allowed. On the right, the same input 1 leads to 3 and 5, so it is not a function.

LESSON 4 | WORKED EXAMPLES

Read a rule or a table

Example 1 | If $f(x) = 2x + 1$, find $f(-2)$

$$f(-2) = 2(-2) + 1$$

The input is -2 . Replace x with (-2) .

$$f(-2) = -4 + 1 = -3$$

Follow the order of operations.

f is the name of the function. $f(-2)$ is an output, not f multiplied by -2 .

Example 2 | If $g(x) = x^2 - 3$, find $g(-2)$

$$g(-2) = (-2)^2 - 3$$

Put the entire negative input in parentheses.

$$g(-2) = 4 - 3 = 1$$

Square first, then subtract.

Example 3 | A function can be given by a table

Input x	-2	-1	0	1	2
Output $h(x)$	5	3	1	-1	-3

Read the column, rather than searching for a formula: **$h(1) = -1$** . The ordered pair is $(1, -1)$. Each listed input has one output, so the table represents a function on those inputs.

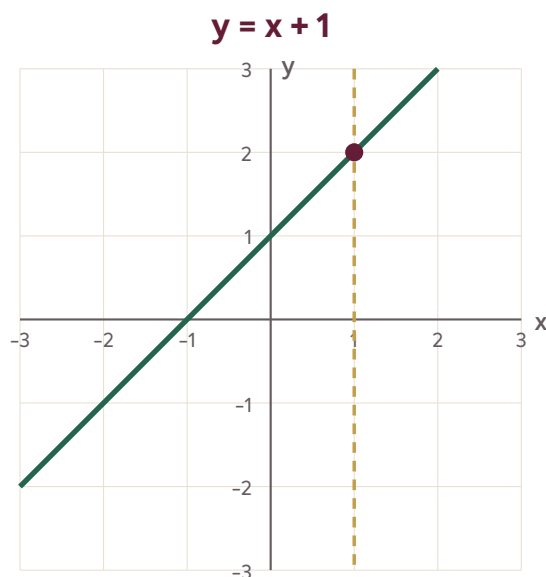
Repeated rows or repeated outputs?

Two copies of the same pair do not create two different outputs. The problem occurs when **one input has different outputs**.

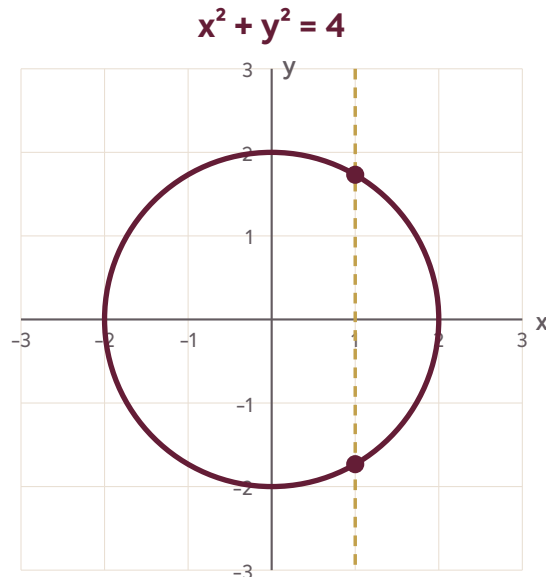
LESSON 4 | THE VERTICAL LINE TEST

Spot a function on a graph

Imagine moving a vertical line across a graph. If any vertical line hits the graph more than once, one x -value has more than one y -value: the relation is **not a function of x** .



One output at $x = 1$: a function.



Two outputs at $x = 1$: not a function.

The dashed test line in both pictures is $x = 1$. On the straight line there is one marked output. On the circle there are two. You only need one such counterexample to show a relation is not a function.

You can also decide from words

“Each student is assigned exactly one locker number” describes a function from students to locker numbers. If one student is assigned two different numbers, that relationship is not a function from students to locker numbers.

Keep the direction clear: a statement about inputs going to outputs does not automatically tell you whether the reversed relationship is a function.

LESSON 4 | SHORT CHECKS

Your turn

For classification questions, explain your decision using inputs and outputs.

1. Which set represents a function?

$$A = \{(1, 2), (2, 2), (3, 5)\}$$

$$B = \{(1, 2), (1, 5), (3, 5)\}$$

2. If $f(x) = 2x - 5$, find $f(-3)$.

3. A table gives $h(1) = -4$, $h(2) = 0$ and $h(3) = 6$. What is $h(3)$? Write the matching ordered pair.

4. Inputs -2 and 2 both give output 4 . Does that fact alone stop the relation being a function? Explain.

5. Is the horizontal line $y = 4$ a function of x ? Explain using the vertical line test.

One sentence to remember

Every input must have exactly one output. Outputs do not have to be different from one another.

LESSON 4 | WORKED ANSWERS AND RECAP

Check your thinking

1. **A is a function:** each input has one output. **B is not:** input 1 has two different outputs, 2 and 5.
2. $f(-3) = 2(-3) - 5 = -6 - 5 = -11$.
3. $h(3) = 6$, so the ordered pair is **(3, 6)**. Input comes first.
4. **No.** Different inputs may share an output. The problem would be one input producing two different outputs.
5. **Yes.** At every x -value, the line gives exactly one output: 4. A vertical line meets it once.

Different representations, one question

Whether you see words, ordered pairs, a table, a mapping, a graph or a formula, ask: “**Does each input have exactly one output?**”

I can...

- ☐ Identify an input and its output.
- ☐ Read $f(x)$ as function notation, not multiplication.
- ☐ Use an input-output argument or a vertical line test.

Next class: solve and graph inequalities. Standard Algebra I: A.12A–B. Advanced Grade 8: §111.31(d)(12)(A)–(C).

LESSON 5 | MEET THE IDEA

Solving one-variable linear inequalities

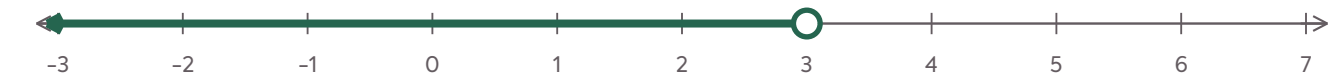
Tuesday, October 27, 2026 . 6:00–7:00 PM Central

By the end, I can...

Solve a linear inequality, draw its solution set on a number line, and explain when the inequality sign must reverse.

An **inequality** compares values. Its solution is usually a **set of numbers**. For example, $x < 3$ includes 2, 0 and -5, but excludes 3 and 4.

Symbol	Read it as	Endpoint on a number line
$<$	less than	Open circle: endpoint excluded.
$\leq$	less than or equal to	Closed circle: endpoint included.
$>$	greater than	Open circle: endpoint excluded.
$\geq$	greater than or equal to	Closed circle: endpoint included.



$x < 3$: open at 3, with the ray extending left toward smaller numbers.

The rule that needs special care

Adding or subtracting the same value keeps the inequality direction. Multiplying or dividing both sides by a **negative** number reverses it.

LESSON 5 | WORKED EXAMPLES

Solve, draw and check

Example 1 | Solve $-2x + 5 \leq 13$

$$-2x \leq 8$$

Subtract 5 from both sides.

$$x \geq -4$$

Divide by -2 and reverse $\leq$ to $\geq$.

Check $x = 0$: $5 \leq 13$ is true. Check $x = -5$: $15 \leq 13$ is false.



Include -4 and all larger real numbers.

Example 2 | Solve $3(x - 2) > x + 4$

$$3x - 6 > x + 4$$

Distribute.

$$2x > 10$$

Subtract x , then add 6, on both sides.

$$x > 5$$

Divide by positive 2; keep the direction.



Exclude 5 and include all larger real numbers.

LESSON 5 | MEANING AND CONTEXT

Why does the sign reverse?

Start with $2 < 5$. Multiplying both sides by -1 gives -2 and -5 . On a number line, -2 is to the **right** of -5 , so $-2 > -5$. Multiplying by a negative reverses their order.

Do not reverse it for every negative number

Subtracting 4 from both sides keeps the direction. Dividing both sides by -4 reverses it. The **operation** is what matters.

Example 3 | A \$35 budget

$$6n + 5 \leq 35$$

Each activity costs \$6, plus a \$5 entry fee.

$$6n \leq 30$$

Subtract the entry fee.

$$n \leq 5$$

Divide by 6.

Here n counts activities, so n must be a nonnegative whole number: 0, 1, 2, 3, 4 or 5. Five is the maximum.

When the variable terms cancel

Always true: $3(x + 2) \geq 3x + 5$ becomes $6 \geq 5$. Every real x works.

Always false: $3(x + 2) < 3x + 1$ becomes $6 < 1$. There is no solution.

A context can narrow the set

For a measurement, decimal values might make sense. For a number of activities, use whole numbers. State the sensible restriction along with the inequality.

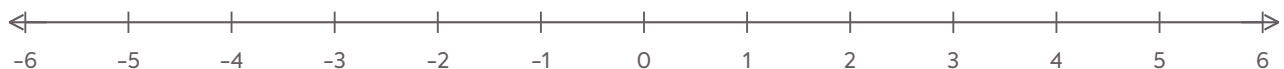
LESSON 5 | SHORT CHECKS

Your turn

Solve Questions 1–3. Graph your solution for Question 2 on the number line and explain whether the endpoint is included.

1. $x + 4 < 9$

2. $-3x \geq 12$



3. $2(x + 1) \leq x + 7$

4. An activity center charges \$4 entry plus \$3 per activity. You have \$19. Write and solve an inequality for n activities. State the possible whole-number values.

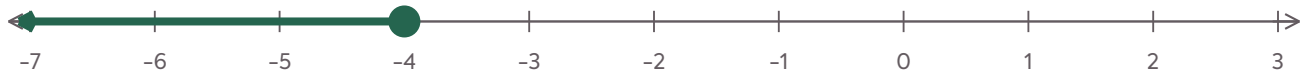
5. A student solves $-2x > 8$ and writes $x > -4$. Correct the answer and explain the error.

Check your graph: is your arrow pointing toward numbers that satisfy the original inequality? Try one number on the shaded side.

LESSON 5 | WORKED ANSWERS AND RECAP

Check your thinking

1. Subtract 4: $x < 5$. The endpoint is open and the ray extends left.
2. Divide by -3 and reverse the sign: $x \leq -4$. Include -4 and shade to the left.



Question 2: -4 is included because the comparison allows equality.

3. $2x + 2 \leq x + 7$ gives $x + 2 \leq 7$, so $x \leq 5$.
4. $3n + 4 \leq 19$ gives $3n \leq 15$, so $n \leq 5$. With n a nonnegative whole number, the options are **0, 1, 2, 3, 4 or 5**.
5. The correct answer is $x < -4$. Dividing by -2 reverses $>$ to $<$. For example, $x = -5$ makes $10 > 8$ true.

I can...

- ☐ Reverse the sign only when the operation requires it.
- ☐ Use open or closed endpoints correctly.
- ☐ Check a solution and interpret restrictions in context.

Next class: review the chapter and repair specific gaps. Curriculum focus: TEKS A.5B.

LESSON 6 | REVIEW AND RECONNECT

Unit 1 checkpoint and foundation repair

Thursday, October 29, 2026 . 6:00–7:00 PM Central

Today is for evidence and improvement

Review the foundations, complete the teacher-provided checkpoint, and use your work to choose what to practice next. These notes are a **revision guide**; they do not contain the graded checkpoint or its answer key.

Skill	Ask yourself	Revisit
Expressions	Did I substitute carefully and combine only like terms?	Class 1
Equations	Did I keep both sides equal and check my answer?	Class 2
Formulas	Did I isolate the requested letter and note restrictions?	Class 3
Functions	Does each input have exactly one output?	Class 4
Function notation	Did I find the output at the requested input?	Class 4
Inequalities	Did I handle the direction and endpoint correctly?	Class 5

A useful routine for today

Retrieve: try a question without notes.

Check: compare your reasoning, not only your final number.

Repair: name the exact step that went wrong.

Retry: solve a new question using the corrected idea.

The one-hour class includes a 20-minute checkpoint. Your teacher will decide which examples or questions to revisit from the evidence in your work.

LESSON 6 | WORKED CORRECTIONS

Repair the step, not just the answer

Repair 1 | Distribution with a negative

$$-2(x - 3) = -2x + 6$$

The second product is $(-2)(-3) = +6$.

If you wrote $-2x - 6$, you changed the second sign incorrectly. Try $x = 0$ to check.

Repair 2 | An equation with brackets

$$3(x + 2) = 2x + 11$$

Start with the original equation.

$$3x + 6 = 2x + 11$$

Distribute.

$$x = 5$$

Subtract $2x$ and then subtract 6 .

Check: both sides equal 21 when $x = 5$.

Look carefully at...	The correct reasoning
$A = lw$	$w = A/l$, with $l \neq 0$. Divide the whole side by l .
$f(x) = x^2 + 1$	$f(-2) = (-2)^2 + 1 = 5$. $f(-2)$ is an output.
$-4x \leq 12$	$x \geq -3$. Dividing by a negative reverses the sign.

A stronger correction: “I forgot to multiply the second term by -2 ” tells you what to change. “I made a silly mistake” does not identify the next action.

LESSON 6 | PREPARE, THEN REFLECT

A short practice check-in

These are practice questions, not the graded checkpoint. Try them independently. Worked answers are on the next page.

1. Simplify $5a - 2a + 4$, then evaluate it at $a = 2$.

2. Solve $2(x + 1) = x + 7$.

3. $v = d/t$. Make d the subject. What condition is required by the original formula?

4. Does $\{(0, 1), (0, 2), (3, 4)\}$ represent a function? Explain.

5. If $g(x) = 3x - 4$, find $g(2)$.

6. Solve $-2x + 3 > 9$. Describe its number-line graph.

Choose a useful next step

Circle the class number you need to revisit: **1 . 2 . 3 . 4 . 5**. Use one worked example from that lesson, then attempt a fresh question without looking.

LESSON 6 | ANSWERS AND NEXT STEPS

Check, reflect and move forward

1. $5a - 2a + 4 = 3a + 4$. At $a = 2$, the value is $3(2) + 4 = 10$.
2. $2x + 2 = x + 7$, so $x = 5$. Both original sides equal 12.
3. Multiply by t : $d = vt$. The original $v = d/t$ requires $t \neq 0$. Retain that condition when describing an equivalent rearrangement.
4. **Not a function:** input 0 has two different outputs, 1 and 2.
5. $g(2) = 3(2) - 4 = 2$.
6. $-2x > 6$, so $x < -3$. Use an open circle at -3 and a ray extending left.

My correction plan

Write one specific response	Your notes
A skill I can now explain	
A step I still need to practice	
The lesson/example I will revisit	

Next chapter: connect equations to slopes, graphs and real data. Your teacher will use the checkpoint and your earlier work to guide support. A completed page is not the same as a demonstrated skill.

KEEP THIS PAGE FOR REVISION

Chapter 1 quick reference

Idea	Remember	Example
Substitution	Replace the input everywhere; use parentheses for a negative value.	$3(-2) + 7 = 1$
Distribution	Multiply every term inside the parentheses.	$2(x + 3) = 2x + 6$
Like terms	Combine matching variable parts; keep the signs.	$5x - 2x + 4 = 3x + 4$
Equations	Use the same valid operation on both sides.	$3x + 7 = 22$ gives $x = 5$
Literal equations	Isolate the requested letter and keep restrictions.	$A = lw$ gives $w = A/l$, $l \neq 0$
Functions	Each input has exactly one output.	$f(x) = 2x + 1$ gives $f(3) = 7$
Inequalities	Reverse the sign when multiplying or dividing by a negative.	$-2x \leq 8$ gives $x \geq -4$

Two final checks**Algebra:** does your answer satisfy the original statement?**Context:** do its units and possible values make sense?

When you get stuck

Name the step you do not understand. Find the matching worked example. Cover its next line, predict the move, then reveal and compare. Afterward, try a fresh question independently.

STUDY GUIDANCE AND CURRICULUM REFERENCES

Make these notes work for you

Before, during and after class

Before: read the learning goals and recall the previous lesson.

During: follow the reasons beside each example and write your own working.

After: attempt the short checks before reading the worked answers, then complete the digital practice assigned by your teacher.

Use the answers to understand the method

Compare the steps and explain any difference. If another valid method gives the same result, discuss it with your teacher. Copying a final answer will not show what you understand.

About the checkpoint

Class 6 is a review and correction lesson. Its practice check-in is not the graded unit checkpoint. The teacher supplies that assessment separately and uses it alongside your earlier work to choose the next practice.

Curriculum alignment

This chapter supports Texas Algebra I §111.39(c): A.10D, A.5A, A.12E, A.12A–B and A.5B, with mathematical reasoning and communication throughout. It also covers the corresponding Grade 8 advanced Algebra I expectations under §111.31(d), including ordered pairs and mappings in (12)(A).

The examples and explanations are original Cambridge Veritas material. These are supplementary tutoring notes; they are not an official TEA publication.

Official references

Texas Education Agency: [Current mathematics standards index](#).

Standard Algebra I: [§111.39, high-school mathematics TEKS](#).

Advanced Grade 8 Algebra I: [§111.31, middle-school mathematics TEKS, adopted 2025](#).

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