

LESSON 45 | MEET THE IDEA

Cumulative review and targeted readiness practice

Tuesday, April 13, 2027 . 6:00–7:00 PM Central

By the end, I can...

Choose evidence-based review priorities, connect different representations and check my reasoning before the final course assessment.

Use your earlier work and teacher feedback to choose **two priorities**. This shared guide is a balanced review; it does not claim to know your personal gaps.

Chapter	Return here for...
1 . Classes 1–6	Expressions, equations, formulas, functions and one-variable inequalities
2 . Classes 7–14	Slope, line equations, domains, transformations and data
3 . Classes 15–20	Two-variable inequalities and systems
4 . Classes 21–26	Exponents, radicals and polynomial operations
5 . Classes 27–32	Factoring and quadratic graph features
6 . Classes 33–38	Four quadratic-solving methods and modeling
7 . Classes 39–43	Sequences and exponential functions
8 . Class 44	Model choice, correlation and prediction limits

Your teacher can select practice from actual assessment evidence. The one-page formula sheet supports revision, but using a formula correctly still requires choosing a method and checking restrictions.

LESSON 45 | LINEAR REASONING

Keep equations balanced and graphs honest

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

$$3x - 6 = 2x + 5$$

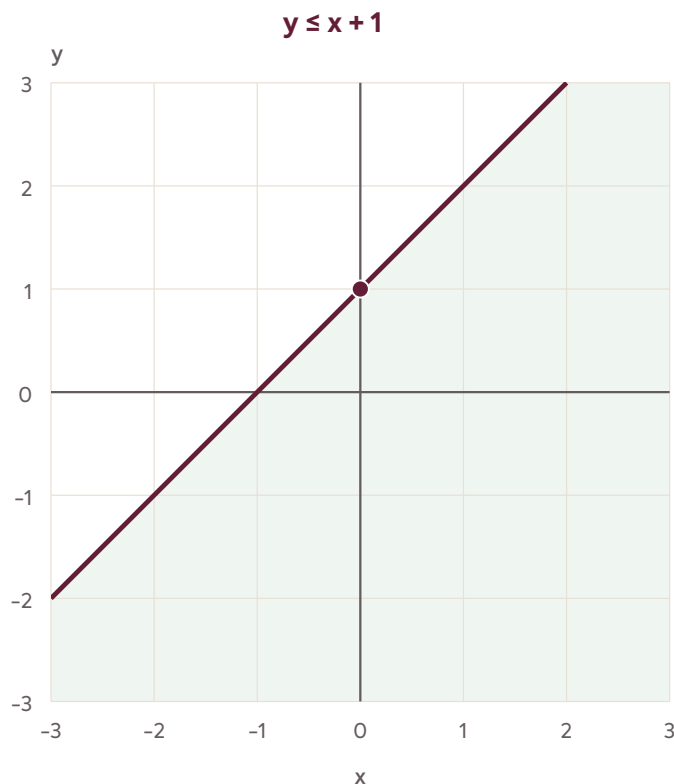
Distribute 3 to both terms.

$$x = 11$$

Subtract $2x$, then add 6 on both sides.

Check: $3(11 - 2) = 27$ and $2(11) + 5 = 27$.

For a formula, isolate the requested variable using the same balance idea. From $A = (1/2)bh$, solve $h = 2A/b$, provided $b \neq 0$. Keep track of any division restriction.



1. Draw the solid line $y = x + 1$.
2. Test $(0, 0)$: $0 \leq 1$ is true.
3. Shade the side containing $(0, 0)$. Boundary points are included.

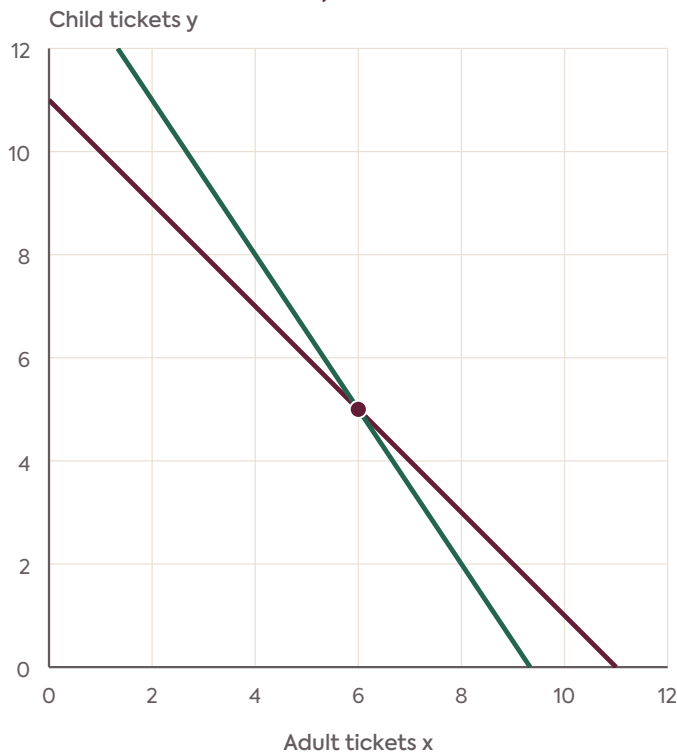
For a strict inequality ($<$ or $>$), draw a dashed boundary. For $\leq$ or $\geq$, use a solid boundary. When multiplying or dividing an inequality by a negative number, reverse its direction.

LESSON 45 | A CONTEXT, TWO EQUATIONS AND A GRAPH

Write the system before solving it

A school event sells 11 tickets: adults pay \$3 and children pay \$2. Total revenue is \$28. Let x be adult tickets and y be child tickets. Both variables must be nonnegative integers.

Two constraints, one intersection



$$x + y = 11$$

Eleven tickets in total.

$$3x + 2y = 28$$

A total price of \$28.

The shared solution is
(6, 5).

Eliminate y

$$2x + 2y = 22$$

Multiply $x + y = 11$ by 2.

$$x = 6; y = 5$$

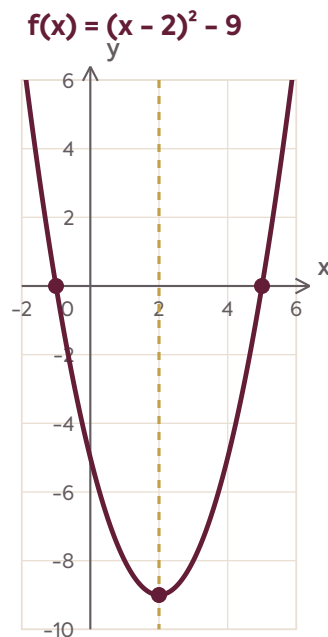
Subtract from $3x + 2y = 28$, then use $x + y = 11$.

Check: $6 + 5 = 11$ and $3(6) + 2(5) = 28$. The continuous lines show the constraints; only whole-number ticket counts are meaningful.

One intersection means one solution. Parallel distinct lines have no solution. Two equations for the same line have infinitely many real solutions before any contextual restrictions are applied.

LESSON 45 | THE SAME FUNCTION IN TWO FORMS

Connect a quadratic graph to its solutions



Vertex: (2, -9)

Axis: $x = 2$

Minimum: -9

Zeros: -1 and 5

Domain: all real x

Range: $y \geq -9$

The dashed gold line shows the axis of symmetry.

Solve $f(x) = 0$ in two ways

$$(x - 2)^2 = 9$$

$$x = 2 \pm 3, \text{ so } x = -1 \text{ or } 5$$

$$x^2 - 4x - 5 = 0$$

$$(x - 5)(x + 1) = 0$$

Use vertex form and isolate the square.

Both signs give a root.

Expand the same function into standard form.

Factoring gives the same two solutions.

The method can change; the solution set should agree

Square roots are efficient when a square is isolated. Factoring is efficient when factors are recognizable. Completing the square and the quadratic formula handle other real-root cases. Check in the original equation.

LESSON 45 | SYMBOLIC AND EXPONENTIAL CHECKS

Watch the structure of each expression

Simplify with exponent laws

$(6x^3)(2x^2)/(3x)$
 $12x^5/(3x) = 4x^4$

Multiply coefficients and add exponents in the numerator.
Divide coefficients and subtract exponents; $x \neq 0$.

Simplify a numerical radical

$\sqrt{(72)} = \sqrt{(36 \times 2)}$
 $\sqrt{(72)} = 6\sqrt{(2)}$

Find a perfect-square factor.
Keep an exact value until an approximation is needed.

Spot the structure	Use the matching idea
$x^2 + 5x + 6$	Factor to $(x + 2)(x + 3)$: product 6, sum 5.
$P(t) = 300(0.9)^t$	Starts at 300 and decreases by 10% per time unit.
4, 7, 10, ... ; first index 1	Arithmetic: $a_n = 4 + 3(n - 1)$.
4, 8, 16, ... ; first index 1	Geometric: $a_n = 4 \times 2^{n-1}$.

For unrestricted $P(t)$ above, the range is $P > 0$. If the context allows only $t \geq 0$, the range becomes $0 < P \leq 300$. Sequence rules in the table use $n = 1, 2, 3, \dots$.

LESSON 45 | BALANCED MIXED REVIEW

Your turn

These are study questions, not the final assessment. Work on the teacher-selected priorities first. Use graph paper where needed; show the reason for each method.

1. Solve $4(x - 1) = 2x + 10$, then check your solution.

2. Find the line through $(0, 2)$ and $(3, 8)$. Sketch its graph. For $y \geq 2x + 2$, state the boundary style and which side to shade.

3. Solve $x + y = 9$ and $2x + 3y = 23$. Verify both equations.

4. For $f(x) = (x - 1)^2 - 4$, state the vertex, axis of symmetry, zeros and unrestricted range.

5. A positive quantity starts at 200 and loses 10% per hour. Write a model and predict its value after 2 hours.

6. Simplify $\sqrt{(50)}$ and $(2x^3)(3x^2)/x$. State any restriction inherited from the original expression.

7. For 5, 10, 20, ... with first index $n = 1$, write explicit and recursive rules. Find the fifth term.

LESSON 45 | WORKED ANSWERS AND READINESS

Use your answers to choose the next step

1. $4x - 4 = 2x + 10$, so $2x = 14$ and $x = 7$. Check: $4(6) = 24$ and $2(7) + 10 = 24$.
2. Slope = $(8 - 2)/(3 - 0) = 2$. The line is $y = 2x + 2$. Plot $(0, 2)$ and $(3, 8)$, then draw the line through them. For $y \geq 2x + 2$, use a **solid boundary and shade above**. The origin fails $0 \geq 2$, so it is not shaded.
3. Double the first equation: $2x + 2y = 18$. Subtract to get $y = 5$, then $x = 4$. Checks: $4 + 5 = 9$ and $8 + 15 = 23$.
4. Vertex $(1, -4)$; axis $x = 1$. Solve $(x - 1)^2 = 4$ to obtain zeros **-1 and 3**. The graph opens upward, so the range is $y \geq -4$.
5. $P(t) = 200(0.9)^t$, where t is hours since the start. $P(2) = 200 \times 0.81 = 162$.
6. $\sqrt{(50)} = 5\sqrt{(2)}$. The second expression is $6x^5/x = 6x^4$, with $x \neq 0$ inherited from the original denominator.
7. Explicit: $a_n = 5 \times 2^{n-1}$, $n = 1, 2, \dots$. Recursive: $a_1 = 5$; $a_n = 2a_{n-1}$, $n = 2, 3, \dots$. $a_5 = 80$.

Before the final

- ☐ Choose two priorities using real errors or teacher feedback.
- ☐ Practice explaining one graph and checking one equation.
- ☐ Confirm the assessment link, scratch paper and permitted tools.

Next class: the internal course assessment, followed by feedback and a short personal practice plan. A single score samples learning; it does not replace the evidence collected across the course.