

6th Grade Math Final Exam Review

Everything on a typical 6th grade math final, one unit at a time: the rules you need, the mistakes that cost the most points, and three practice questions per unit with answers. Start with the quick checks to find your weak units, then use the linked lessons to fix them.

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What's on the 6th Grade Math final

Most schools teach number skills (decimals, dividing fractions, GCF and LCM), ratios, rates and percents in the first semester, then expressions, equations, negative numbers and the coordinate plane, geometry and statistics in the second. The order varies by textbook: some courses open with area and surface area, and expressions sometimes start before winter break. If your final is in December, focus on the Semester 1 units and check your review sheet for the rest.

Unit	Usually on	Lessons
1. Decimals, division, GCF & LCM	Semester 1	Number Foundations, Ratios, Rates & the Number System
2. Dividing fractions	Semester 1	Ratios, Rates & the Number System, Number Foundations
3. Ratios, rates & unit conversion	Semester 1	Ratios, Rates & the Number System, Measurement & Unit Conversion
4. Percents	Semester 1	Ratios, Rates & the Number System
5. Expressions & exponents	Semester 2	Expressions & Equations, Number Foundations
6. Equations & inequalities	Semester 2	Expressions & Equations
7. Negative numbers & the coordinate plane	Semester 2	Integers & the Four-Quadrant Plane, Ratios, Rates & the Number System
8. Area, surface area & volume	Semester 2	Geometry: Area, Volume & the Coordinate Plane

Unit	Usually on	Lessons
9. Statistics & data displays	Semester 2	Statistics: Center, Spread & Plots, Bar, Line & Circle Graphs

A two-week study plan

DAY 14

Find your weak units

Do the quick checks for all 9 units without notes. Mark each unit solid, shaky or lost. This tells you where your study time goes.

DAYS 13–6

Fix the lost and shaky units, one a day

Start with the units you marked lost, then shaky. For each one, read the must-know list, work through the linked lesson, and redo that unit's quick checks until you get all three right.

DAYS 5–3

Mixed practice

Finals mix units together, so practice that way: pick problems from different units, work them without looking at which unit they came from, and check each answer.

DAY 2

Formulas and mistakes

Review the formula sheet and every "common mistakes" list. Write out from memory the formulas you still look up.

DAY 1

Light review and sleep

Redo only the questions you missed before. Then stop: a full night of sleep helps your memory more than a late cram session.

UNIT 1 • SEMESTER 1

Decimals, division, GCF & LCM

MUST KNOW

- To add or subtract decimals, line up the decimal points and fill empty places with zeros: $3.5 + 1.25 = 3.50 + 1.25 = 4.75$.
- To multiply decimals, multiply as whole numbers, then give the answer as many decimal places as the factors have in all: $0.6 \cdot 0.04 = 0.024$.
- To divide by a decimal, move the decimal point in the divisor and the dividend the same number of places until the divisor is a whole number: $4.5 \div 0.15 = 450 \div 15 = 30$.
- Long division repeats four steps: divide, multiply, subtract, bring down.
- The GCF is the greatest factor two numbers share; the LCM is the least multiple they share. The GCF can factor a sum: $24 + 36 = 12(2 + 3)$.

COMMON MISTAKES

- Lining up the last digits instead of the decimal points, which turns $3.5 + 1.25$ into a wrong answer like 1.60.
- Using the wrong one of GCF and LCM. Splitting things into equal groups with nothing left over calls for the GCF; finding when two repeating events line up again calls for the LCM.

QUICK CHECK

1.1 Multiply $2.4 \cdot 0.35$.

1.2 Divide $7.2 \div 0.08$.

1.3 Find the GCF and the LCM of 12 and 18.

UNIT 2 • SEMESTER 1

Dividing fractions

MUST KNOW

- To divide by a fraction, multiply by its reciprocal: $\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c}$.
- Change mixed numbers to improper fractions before dividing: $2\frac{1}{2} = \frac{5}{2}$.
- Division asks how many groups fit: $3 \div \frac{1}{4} = 12$ because 12 quarters fit in 3 wholes.
- Dividing by a fraction less than 1 gives an answer bigger than the number you started with.
- Check with multiplication: $\frac{2}{3} \div \frac{3}{4} = \frac{8}{9}$, and $\frac{8}{9} \cdot \frac{3}{4} = \frac{2}{3}$.

COMMON MISTAKES

- Flipping the first fraction instead of the second. Only the divisor (the number you divide by) gets flipped.
- Flipping a mixed number without converting it. The reciprocal of $2\frac{1}{2}$ is $\frac{2}{5}$, because $2\frac{1}{2} = \frac{5}{2}$.

QUICK CHECK

2.1 Divide $\frac{3}{4} \div \frac{1}{8}$.

2.2 Divide $2\frac{1}{2} \div \frac{3}{4}$.

2.3 A ribbon $\frac{5}{6}$ yard long is cut into pieces $\frac{1}{12}$ yard long. How many pieces are there?

UNIT 3 · SEMESTER 1

Ratios, rates & unit conversion

MUST KNOW

- A ratio compares two quantities in order: $3 : 4$, 3 to 4, or $\frac{3}{4}$. It can compare part to part or part to whole.
- Equivalent ratios multiply or divide both parts by the same number. Ratio tables, tape diagrams and double number lines show this scaling.
- A unit rate is the amount for one: divide. Compare prices by finding the cost per item or per ounce.
- Convert units with a unit rate set up so the old unit cancels: $48 \text{ in} \cdot \frac{1 \text{ ft}}{12 \text{ in}} = 4 \text{ ft}$.
- Know the common facts: 12 inches in a foot, 3 feet in a yard, 16 ounces in a pound, 4 quarts in a gallon, 1,000 meters in a kilometer and 100 centimeters in a meter.

COMMON MISTAKES

- Writing a ratio in the wrong order. "Boys to girls" means the number of boys comes first.
- Multiplying when you should divide in a conversion. Going to a bigger unit gives a smaller number, so 48 inches is 4 feet, not 576.

QUICK CHECK

3.1 A class has 12 boys and 18 girls. What is the ratio of boys to all students in simplest form?

3.2 An 8-pack of pens costs 6 dollars and a 12-pack costs 8.40 dollars. Which is the better buy?

3.3 How many feet are in 90 inches?

UNIT 4 · SEMESTER 1

Percents

MUST KNOW

- Percent means "per 100": $35\% = \frac{35}{100} = 0.35$.
- Fractions, decimals and percents name the same amount: $\frac{3}{5} = 0.6 = 60\%$.
- To find a percent of a number, multiply by the decimal: 30% of 70 is $0.3 \cdot 70 = 21$.
- To find the whole from a part and a percent, divide the part by the decimal: if 15 is 25% of a number, the number is $15 \div 0.25 = 60$.
- Benchmarks help you estimate: $50\% = \frac{1}{2}$, $25\% = \frac{1}{4}$, $10\% = \frac{1}{10}$ and $1\% = \frac{1}{100}$.

COMMON MISTAKES

- Writing 5% as 0.5. It is 0.05; 0.5 is 50%.
- Switching the part and the whole. In "18 is what percent of 24," 24 is the whole, so divide 18 by 24.

QUICK CHECK

4.1 What is 40% of 65?

4.2 18 is what percent of 24?

4.3 12 is 30% of what number?

UNIT 5 · SEMESTER 2

Expressions & exponents

MUST KNOW

- An exponent tells how many times to multiply the base: $2^4 = 2 \cdot 2 \cdot 2 \cdot 2 = 16$.
- Order of operations: parentheses, then exponents, then multiply and divide left to right, then add and subtract left to right.
- In $4x + 7$, the terms are $4x$ and 7 , the coefficient is 4 , the variable is x and the constant is 7 .
- Words to symbols: "5 less than x " is $x - 5$, "the product of 3 and n " is $3n$, and "twice the sum of n and 7" is $2(n + 7)$.
- Build equivalent expressions with the distributive property, $3(x + 4) = 3x + 12$, and by combining like terms, $2y + 5y = 7y$.

COMMON MISTAKES

- Reading 2^3 as $2 \cdot 3$. It means $2 \cdot 2 \cdot 2 = 8$.
- Writing "5 less than x " as $5 - x$. The 5 is taken away from x , so it is $x - 5$.
- Squaring the coefficient too. When $x = 4$, $3x^2 = 3 \cdot 16 = 48$, not $12^2 = 144$.

QUICK CHECK

5.1 Evaluate $5 + 2(8 - 3)^2$.

5.2 Write an expression for "twice the sum of a number n and 7," then use the distributive property to rewrite it.

5.3 Are $4(x + 2)$ and $4x + 2$ equivalent? Explain.

UNIT 6 · SEMESTER 2

Equations & inequalities

MUST KNOW

- A solution makes the equation true. Check by substituting it back in.
- Solve a one-step equation with the inverse operation on both sides: $x + 7 = 15$ gives $x = 8$, and $4x = 28$ gives $x = 7$.
- An inequality like $x > 3$ has infinitely many solutions. Graph it with an open circle for $<$ or $>$ and a closed circle for $\leq$ or $\geq$.
- Key phrases: "at least" means $\geq$, "at most" and "no more than" mean $\leq$, and "more than" means $>$.
- The independent variable is the input you choose; the dependent variable changes because of it. In $d = 50t$, the distance d depends on the time t .

COMMON MISTAKES

- Doing the operation you see instead of its inverse. In $x - 6 = 10$, add 6 to get $x = 16$.
- Using an open circle for $\geq$ or $\leq$. The endpoint is included, so the circle is closed.

QUICK CHECK

6.1 Solve $\frac{3}{4}x = 12$.

6.2 Solve $x + 4.5 = 11.2$.

6.3 A ride requires riders to be at least 48 inches tall. Write an inequality for height h and describe its graph.

Negative numbers & the coordinate plane

MUST KNOW

- Positive and negative numbers describe opposite directions from zero: above and below sea level, deposits and withdrawals, above and below zero degrees.
- Opposites are the same distance from zero on opposite sides, and $-(-5) = 5$.
- Absolute value is distance from zero, so $|-8| = 8$. A balance of -30 dollars means a debt of 30 dollars.
- On a number line, numbers get smaller to the left, so $-7 < -2$.
- Quadrant signs: I is $(+, +)$, II is $(-, +)$, III is $(-, -)$ and IV is $(+, -)$. Reflecting over the x -axis changes the sign of y ; reflecting over the y -axis changes the sign of x .
- For two points with the same x or the same y , the distance is the difference of the other coordinates: $(-3, 2)$ and $(5, 2)$ are $|5 - (-3)| = 8$ units apart.

COMMON MISTAKES

- Thinking $-9 > -4$ because $9 > 4$. -9 is farther left, so it is smaller.
- Plotting (x, y) backwards. Move across for x first, then up or down for y .

QUICK CHECK

7.1 Order from least to greatest: 0.5 , -2 , -2.5 , $\frac{1}{4}$, $-\frac{1}{2}$.

7.2 Which quadrant is $(-4, 7)$ in? Where does it land after a reflection over the x -axis?

7.3 Find the distance between $(-3, 5)$ and $(-3, -4)$.

UNIT 8 · SEMESTER 2

Area, surface area & volume

MUST KNOW

- Area formulas: rectangle $A = lw$, parallelogram $A = bh$, triangle $A = \frac{1}{2}bh$, where the height is perpendicular to the base.
- Find the area of other polygons, like trapezoids and composite shapes, by splitting them into rectangles and triangles and adding the pieces.
- The volume of a rectangular prism is $V = lwh$, even when the edges are fractions.
- Surface area is the sum of the areas of all the faces. A net lays them flat; a box has 6 rectangular faces in 3 matching pairs.
- On the coordinate plane, a horizontal or vertical side length is the difference of the coordinates that change.
- Area is in square units; volume is in cubic units.

COMMON MISTAKES

- Using a slanted side as the height of a triangle or parallelogram. The height must make a right angle with the base.
- Leaving out faces when finding surface area from a net. Count all 6 faces of a box.

QUICK CHECK

8.1 Find the area of a triangle with base 9 cm and height 6 cm.

8.2 Find the volume of a rectangular prism with edges $2\frac{1}{2}$ ft, 2 ft and $\frac{3}{4}$ ft.

8.3 Find the surface area of a cube with edges 4 inches long.

Statistics & data displays

MUST KNOW

- A statistical question expects answers that vary: "How many hours do students in my class sleep?" is statistical; "How many hours did I sleep last night?" is not.
- Mean is the sum divided by the count. Median is the middle value of the ordered data, or the average of the two middle values when the count is even.
- Spread: range is maximum minus minimum, $IQR = Q_3 - Q_1$, and the mean absolute deviation (MAD) is the average distance of the values from the mean.
- Dot plots show every value; histograms count values in equal intervals with touching bars; box plots show the five-number summary: minimum, Q_1 , median, Q_3 , maximum.
- Outliers pull the mean toward them. For lopsided data, the median and IQR describe a typical value better than the mean and MAD.

COMMON MISTAKES

- Finding the median without putting the data in order first.
- Reading a histogram bar as one data value. Each bar is a count of how many values fall in that interval.

QUICK CHECK

9.1 Find the mean and median of 4, 9, 6, 10, 6.

9.2 Find the mean absolute deviation of 2, 4, 6, 8, 10.

9.3 A box plot shows minimum 2, $Q_1 = 5$, median 8, $Q_3 = 12$ and maximum 20. Find the range and the IQR.

Answer key

Unit 1: Decimals, division, GCF & LCM

1.1 0.84. $24 \cdot 35 = 840$, and the factors have three decimal places in all, so 0.840.

1.2 90. Move both decimal points two places: $720 \div 8 = 90$.

1.3 GCF 6, LCM 36. The factors they share are 1, 2, 3 and 6; the first multiple of 18 that 12 also divides is 36.

Unit 2: Dividing fractions

2.1 6. $\frac{3}{4} \cdot \frac{8}{1} = \frac{24}{4} = 6$.

2.2 $3\frac{1}{3} \cdot \frac{5}{2} \cdot \frac{4}{3} = \frac{20}{6} = \frac{10}{3}$.

2.3 10 pieces. $\frac{5}{6} \div \frac{1}{12} = \frac{5}{6} \cdot 12 = 10$.

Unit 3: Ratios, rates & unit conversion

3.1 2 : 5. There are 30 students, and $12 : 30$ divides by 6 to give 2 : 5.

3.2 The 12-pack. It costs 0.70 dollars per pen, while the 8-pack costs $6 \div 8 = 0.75$ dollars per pen.

3.3 7.5 feet. $90 \div 12 = 7.5$.

Unit 4: Percents

4.1 26. $0.4 \cdot 65 = 26$.

4.2 75%. $\frac{18}{24} = \frac{3}{4} = 0.75$.

4.3 40. $12 \div 0.3 = 40$; check: $0.3 \cdot 40 = 12$.

Unit 5: Expressions & exponents

5.1 55. Parentheses give 5, then $5^2 = 25$, then $2 \cdot 25 = 50$, then $5 + 50 = 55$.

5.2 $2(n + 7) = 2n + 14$.

5.3 No. $4(x + 2) = 4x + 8$. Testing $x = 1$ gives 12 for the first and 6 for the second.

Unit 6: Equations & inequalities

6.1 $x = 16$. Divide by $\frac{3}{4}$, which is the same as multiplying by $\frac{4}{3}$: $12 \cdot \frac{4}{3} = 16$.

6.2 $x = 6.7$. Subtract 4.5 from both sides.

6.3 $h \geq 48$. Closed circle at 48, shaded to the right, because 48 inches is allowed.

Unit 7: Negative numbers & the coordinate plane

7.1 $-2.5, -2, -\frac{1}{2}, \frac{1}{4}, 0.5$. Among the negatives, the one farthest from zero is smallest.

7.2 Quadrant II. The reflection is $(-4, -7)$, in Quadrant III.

7.3 9 units. The x -coordinates match, so the distance is $|5 - (-4)| = 9$.

Unit 8: Area, surface area & volume

8.1 27 square cm. $\frac{1}{2} \cdot 9 \cdot 6 = 27$.

8.2 $3\frac{3}{4}$ cubic feet. $\frac{5}{2} \cdot 2 \cdot \frac{3}{4} = \frac{30}{8} = \frac{15}{4}$.

8.3 96 square inches. Each face is $4 \cdot 4 = 16$, and a cube has 6 faces.

Unit 9: Statistics & data displays

9.1 Mean 7, median 6. The sum is 35 and $35 \div 5 = 7$; in order, 4, 6, 6, 9, 10, the middle value is 6.

9.2 2.4. The mean is 6, the distances from 6 are 4, 2, 0, 2, 4, and $12 \div 5 = 2.4$.

9.3 Range 18, IQR 7. $20 - 2 = 18$ and $12 - 5 = 7$; the middle half of the data lies between 5 and 12.