y = mx + b

x^2 + 5x + 6 = 0

OREGON OSAS

sqrt(x)

7th GRADE MATH



MADE RIDICULOUSLY SIMPLE

A Comprehensive 7th Grade Math Study Guide to Acing the OSAS Test

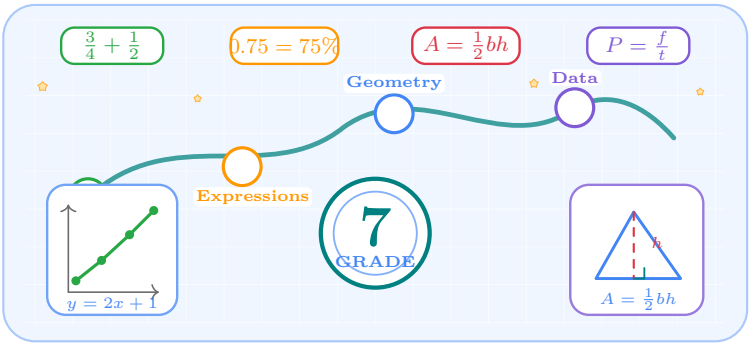
- COVERS ALL 7TH GRADE MATH STANDARDS
- EASY-TO-UNDERSTAND LESSONS & EXAMPLES
- PRACTICE QUESTIONS WITH DETAILED EXPLANATIONS
- TEST-TAKING STRATEGIES & TIPS
- BUILD CONFIDENCE. IMPROVE SCORES. SUCCEED!

LEARN SMART. PRACTICE MORE. ACE THE OSAS!

Oregon OSAS

7th Grade Math Made Ridiculously Simple

A Comprehensive 7th Grade Math Study Guide to Acing the OSAS Test



Reza Nazari

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7.DR.A	Formulate statistical investigative questions
7.DR.A.1	Formulate summary, comparative investigative questions to gain information about a population and that a sample is valid only if the sample is representative of that population
7.DR.B	Collect and consider data
7.DR.B.2	Collect or consider data from a random sample to compare and draw inferences about a population with an unknown characteristic of interest
7.DR.C	Analyze, summarize, and describe data
7.DR.C.3	Analyze two data distributions visually to compare multiple measures of center and variability
7.DR.D	Interpret data and answer investigative questions
7.DR.D.4	Interpret measures of center and measures of variability for numerical data from random samples to compare between two populations, and to answer investigative questions

7.GM | Geometric Reasoning and Measurement

Reason about geometric relationships and apply measurement concepts

7.GM.A	Draw, construct, and describe geometrical figures and describe the relationships between them
7.GM.A.1	Solve problems involving scale drawings of geometric figures. Reproduce a scale drawing at a different scale and compute actual lengths and areas from a scale drawing
7.GM.A.2	Draw triangles from three measures of angles or sides. Understand the possible side lengths and angle measures that determine a unique triangle, more than one triangle, or no triangle
7.GM.B	Solve mathematical problems in authentic contexts involving angle measure, area, surface area, and volume
7.GM.B.3	Understand the relationship between area and circumference of circles. Choose and use the appropriate formula to solve problems with radius, diameter, circumference and area of circles

7.GM.B.4	Apply facts about supplementary, complementary, vertical, and adjacent angles in a multistep problem to determine an unknown angle in a figure
7.GM.B.5	Solve problems in authentic contexts involving two- and three-dimensional figures. Given formulas, calculate area, volume and surface area

7.NS | Numeric Reasoning: Number Systems

Reason about and compute with rational numbers in various forms

7.NS.A	Apply and extend previous understandings of operations with fractions
7.NS.A.1	Apply and extend previous understandings of addition, subtraction and absolute value to add and subtract rational numbers in authentic contexts. Understand subtraction as adding the additive inverse,p–q=p+ (–q)
7.NS.A.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. Interpret operations of rational numbers solving problems in authentic contexts
7.NS.A.3	Understand that equivalent rational numbers can be written as fractions, decimals and percents

7.RP | Proportional Reasoning: Ratios and Proportions

Reason with ratios and proportional relationships to solve problems

7.RP.A	Analyze proportional relationships and use them to solve mathematical problems in authentic contexts
7.RP.A.1	Solve problems in authentic contexts involving unit rates associated with ratios of fractions
7.RP.A.2	Recognize and represent proportional relationships between quantities in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. Identify the constant of proportionality (unit rate) within various representations
7.RP.A.3	Use proportional relationships to solve ratio and percent problems in authentic contexts
7.RP.B	Investigate chance processes and develop, use, and evaluate probability models

7.RP.B.4	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Represent probabilities as fractions, decimals, and percents
7.RP.B.5	Use experimental data and theoretical probability to make predictions. Understand the probability predictions may not be exact
7.RP.B.6	Develop a probability model and use it to find probabilities of events. Compare theoretical and experimental probabilities and explain possible sources of discrepancy if any exists
7.RP.B.7	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation

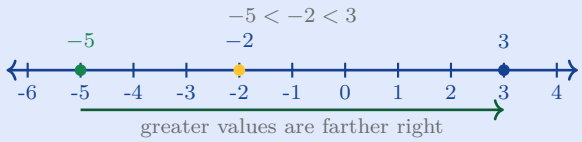
1.3 Comparing and Ordering Integers 7.NS.A.1

The trick to comparing integers is to picture them on a number line. Numbers get larger as you move to the **right** and smaller as you move to the **left**. This is especially handy with negatives—for example, -3 is greater than -8 because -3 is closer to zero (farther right on the line). When a problem asks you to order integers from least to greatest, you are simply listing them in the same left-to-right order they appear on the number line. Once you have this picture in your head, symbols like $<$, $>$, and $=$ become second nature.

Key Concepts & Quick Review

Comparing: $a > b$ means a is to the **right** of b on the number line. $a < b$ means a is to the **left** of b.

Negatives rule: Among two negative integers, the one **closer to zero** is **greater**.
Ordering: list integers from least (leftmost) to greatest (rightmost).



Examples

① Compare -7 and -3. Write $<$, $>$, or $=$.

Think It Through: Put both numbers on a number line in your mind. The number -3 is closer to zero, so it sits to the right of -7. Numbers to the right are greater, and numbers to the left are smaller. Therefore $-7 < -3$.

Answer: $-7 < -3$

② Order from **least to greatest**: $4,\ -9,\ 2,\ -1,\ -6$.

Think It Through: Imagine placing all five integers on a number line. The farthest left is -9, then comes -6, then -1. After the negatives come the positives: 2 and then 4. Reading from left to right gives the order from least to greatest.

Answer: $-9 < -6 < -1 < 2 < 4$

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✎ Practice Problems

Write $<$, $>$, or $=$ in each box to make the statement true.

1. $-5 \square -2$ _____

2. $-8 \square -11$ _____

3. $7 \square -7$ _____

4. $-4 \square 0$ _____

5. $-15 \square -15$ _____

6. $-1 \square -100$ _____

7. $-9 \square 3$ _____

8. $|-6| \square 6$ _____

9. $-|-4| \square -4$ _____

10. $|-10| \square |-12|$ _____

11. $-20 \square -19$ _____

12. $0 \square -1$ _____

13. $-(-3) \square -3$ _____

14. $-|7| \square -7$ _____

15. $-25 \square -52$ _____

Study Tips

- ☞ Among two negative integers, the one with the **smaller absolute value** is **greater**: $-3 > -10$ because $3 < 10$.
- ☞ Any positive integer is always greater than any negative integer: $1 > -1{,}000{,}000$.
- ☞ When ordering a mixed set, negatives always come before zero, and zero comes before all positives.

✍ Word Problems

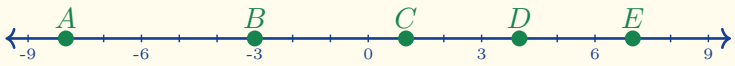
16. Five students competed in a math quiz bowl where correct answers earn points and incorrect answers lose points. Their final net scores were: -16, 8, -4, -21, and 5. Order the scores from *lowest to highest* and identify the student with the best score and the student with the worst score. Then find the range of scores (highest minus lowest).

_____

17. Four ocean animals are recorded at the following depths below the surface: a shark at -85 feet, a jellyfish at -12 feet, a sperm whale at -210 feet, and a yellowfin tuna at -47

feet. Order the animals from *shallowest* to *deepest* depth. How much deeper is the sperm whale than the shark? _____

18. Five points are plotted on the number line shown here. Identify the integer at each point, then list the points in order from least to greatest. Which point has the greatest absolute value?



_____

1.4 Adding Integers

7.NS.A.1

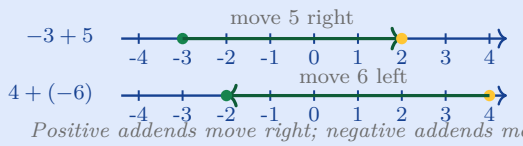
Think of adding integers as combining movements on a number line—or combining gains and losses in everyday life. Here is the key: when both numbers share the same sign, they move in the same direction, so you add the absolute values and keep that sign. When the signs are different, the numbers pull in opposite directions; you subtract the smaller absolute value from the larger one and keep the sign of whichever was stronger. You will also meet **zero pairs** (additive inverses), which show why a positive and its matching negative cancel out completely. Master these two rules and integer addition will feel natural every time.

Key Concepts & Quick Review

Same signs: Add the absolute values; keep the common sign. **Example:** $(-5)+(-8)=-(5+8)=-13$

Different signs: Subtract the smaller $|\cdot|$ from the larger; keep the sign of the larger $|\cdot|$.
Example: $(-9)+4=-(9-4)=-5$

Additive inverse: $a+(-a)=0$ **Identity:** $a+0=a$



Positive addends move right; negative addends move left.

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