y = mx + b

x^2 + 5x + 6 = 0

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sqrt(x)

PSSA

7th GRADE MATH



MADE RIDICULOUSLY SIMPLE

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

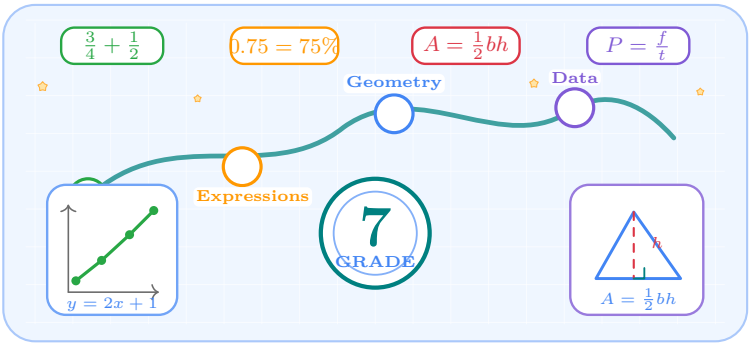
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Pennsylvania PSSA

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2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations

3.7 | Pennsylvania

Grade 7 expectations grouped under 3.7.

3.7.A Draw, construct, and describe geometric figures and solve problems involving angle, area, and volume

3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume

3.7.A.2 Visualize and represent geometric figures and describe the relationships between them

4.7 | Pennsylvania

Grade 7 expectations grouped under 4.7.

4.7.B Use random sampling to draw inferences and develop probability models

4.7.B.1 Draw inferences about populations based on random sampling concepts

4.7.B.2 Draw informal comparative inferences about two populations

4.7.B.3 Investigate chance processes and develop, use, and evaluate probability models

CC.2 | Pennsylvania

Grade 7 expectations grouped under CC.2.

CC.2.1.7 Understand and apply properties of operations with rational numbers

CC.2.1.7.D Analyze proportional relationships and use them to solve problems

CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems

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CC.2.1.7.E	Apply operations with rational numbers including integers, fractions, and decimals
CC.2.1.7.E.1	Apply and extend previous understandings of operations with fractions to operations with rational numbers
CC.2.2.7	Apply algebraic concepts to expressions, equations, and inequalities
CC.2.2.7.B	Use properties of operations to generate equivalent expressions and solve equations
CC.2.2.7.B.1	Apply properties of operations to generate equivalent expressions
CC.2.2.7.B.3	Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations
CC.2.3.7	Draw, construct, and describe geometric figures and solve problems involving angle, area, and volume
CC.2.3.7.A	Draw, construct, and describe geometric figures and solve problems involving angle, area, and volume
CC.2.3.7.A.1	Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume
CC.2.3.7.A.2	Visualize and represent geometric figures and describe the relationships between them
CC.2.4.7	Apply measurement, analyze data, and reason about probability
CC.2.4.7.B	Use random sampling to draw inferences and develop probability models
CC.2.4.7.B.1	Draw inferences about populations based on random sampling concepts
CC.2.4.7.B.2	Draw informal comparative inferences about two populations
CC.2.4.7.B.3	Investigate chance processes and develop, use, and evaluate probability models



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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).

_____

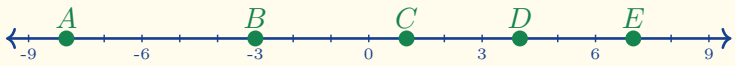
17. Four ocean animals are recorded at the following depths below the surface: a shark at -85 feet, a jellyfish at -12 feet, a sperm whale at -210 feet, and a yellowfin tuna at -47

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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

1.7.E

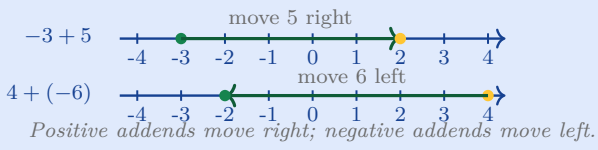
Think of adding integers as combining movements on a number line—or combining gains and losses in everyday life. Here is the key: when both numbers share the same sign, they move in the same direction, so you add the absolute values and keep that sign. When the signs are different, the numbers pull in 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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Examples

① Evaluate $(-13) + 7$.

Think It Through: The signs are different, so subtract the smaller absolute value from the larger one. That gives $13 - 7 = 6$. Now decide the sign by looking at which number has the larger absolute value. Since 13 is larger than 7, the negative number wins. So the sum is -6.

Answer: -6

② A hiker starts at 240 feet above sea level, descends 380 feet, then climbs back up 95 feet. What is the hiker's final elevation?

Think It Through: Translate the changes into integers: $240 + (-380) + 95$. First combine 240 and -380. Because the signs are different, subtract $380 - 240 = 140$ and keep the sign of the larger absolute value, which is negative, so the result is -140. Then add 95: $-140 + 95 = -45$. The final elevation is -45 feet, which means 45 feet below sea level.

Answer: -45 *feet*

Practice Problems

Find each sum.

1. $5 + (-8) =$ _____

2. $(-6) + (-9) =$ _____

3. $(-12) + 7 =$ _____

4. $(-3) + 15 =$ _____

5. $(-14) + (-6) =$ _____

6. $8 + (-8) =$ _____

7. $(-25) + 13 =$ _____

8. $(-9) + (-11) =$ _____

9. $17 + (-24) =$ _____

10. $(-30) + 45 =$ _____

11. $(-7) + (-7) + 4 =$ _____

12. $12 + (-5) + (-9) =$ _____

13. $(-20) + (-15) + 30 =$ _____

14. $(-6) + 13 + (-4) =$ _____

15. $36 + (-49) =$ _____

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