Number Properties — Elementary Algebra Week 1

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Name: _____ Date: _____ Score: / 20

Learning Objectives

- Use the number line to add and subtract positive and negative numbers
- Apply the order of operations (PEMDAS) to simplify expressions
- Identify and classify numbers within the real number sets
- Find the absolute value of integers and rational numbers
- Arrange rational numbers in order and convert fractions to decimals

Simplify each expression completely. Show all steps and circle your final answer.

1. Use the number line to simplify:

$(-7) + 4$

Answer: _____

2. Use the number line to simplify:

$(-5) - (-8)$

Answer: _____

3. Simplify using order of operations (PEMDAS):

$3 + 4 \times 2$

Answer: _____

4. Simplify using PEMDAS:

$(6 + 2)^2 \div 4 - 1$

Answer: _____

5. Simplify using PEMDAS:

$5 \times 3^2 - (4 + 6) \div 2$

Answer: _____

6. Simplify using PEMDAS:

$18 \div (2 + 1) \times 3 - 5$

Answer: _____

7. Classify -7. Write ALL number sets it belongs to (Natural, Whole, Integer, Rational, Real):

-7

Answer: _____

Scan to watch

8. Classify 0. Write ALL number sets it belongs to:

0

Answer: _____

9. Classify this number. Write ALL sets it belongs to:

$\frac{3}{4}$

Answer: _____

10. Evaluate the absolute value:

$|-15|$

Answer: _____

11. Evaluate:

$-|-9|+|4|$

Answer: _____

12. Evaluate:

$|3-10|$

Answer: _____

13. Arrange from least to greatest:

$-\frac{1}{2},\quad 0.6,\quad -0.75,\quad \frac{1}{4}$

Answer: _____

14. Place < , > , or = between the two numbers:

$$- \dfrac{3}{4} \quad \underline{\hspace{1cm}} \quad -0.8$$

Answer: _____

15. Convert the fraction to a decimal:

$\frac{5}{8}$

Answer: _____

16. Convert the fraction to a decimal:

$\frac{7}{9}$

Answer: _____

17. Convert the fraction to a decimal:

$$\frac{11}{4}$$

Answer: _____

18. Simplify (combines PEMDAS + absolute value):

$$2 \times |-6| - 3^2 + 1$$

Answer: _____

19. True or False: Every integer is a rational number. Explain.

True or False? $\mathbb{Z} \subseteq \mathbb{Q}$

Answer: _____

20. A submarine is at -340 ft. It rises 185 ft, then descends 60 ft. What is its final depth?

$$-340 + 185 - 60$$

Answer: _____

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ANSWER KEY & SOLUTIONS

Topics span the full Week 1 lesson: number line, PEMDAS, number sets, absolute value, ordering rationals, and fraction-to-decimal conversion.

Solutions

1. Use the number line to simplify:

$(-7) + 4$

→ *Start at -7, move 4 units right.*
→ *Land on -3.*

Answer: -3

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2. Use the number line to simplify:

$(-5) - (-8)$

→ *Keep-Change-Change: (-5) + 8*
→ *Move 8 units right from -5 → land on 3.*

Answer: 3

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3. Simplify using order of operations (PEMDAS):

$3 + 4 \times 2$

→ *Multiply first: 4 × 2 = 8*
→ *Then add: 3 + 8 = 11*

Answer: 11

---

4. Simplify using PEMDAS:

$(6 + 2)^2 \div 4 - 1$

→ *Parentheses: 6+2=8*
→ *Exponent: 8^2=64*
→ *Divide: 64÷4=16*
→ *Subtract: 16-1=15*

Answer: 15

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5. Simplify using PEMDAS:

$5 \times 3^2 - (4 + 6) \div 2$

→ *Parentheses: 4+6=10*
→ *Exponent: 3^2=9*
→ *Multiply: 5×9=45*
→ *Divide: 10÷2=5*
→ *Subtract: 45-5=40*

Answer: 40

Scan to watch

6. Simplify using PEMDAS:

$18 \div (2 + 1) \times 3 - 5$

→ *Parentheses: 2+1=3*
→ *Left to right: 18÷3=6*
→ *Multiply: 6×3=18*
→ *Subtract: 18-5=13*

Answer: 13

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7. Classify -7. Write ALL number sets it belongs to (Natural, Whole, Integer, Rational, Real):

-7

→ *-7 is negative → not Natural, not Whole.*
→ *-7 is a whole-number value → Integer.*
→ *All integers are Rational and Real.*

Answer: Integer, Rational, Real

---

8. Classify 0. Write ALL number sets it belongs to:

0

→ *0 is not a counting number → not Natural.*
→ *0 is non-negative whole → Whole.*
→ *Whole ⊂ Integer ⊂ Rational ⊂ Real.*

Answer: Whole, Integer, Rational, Real

---

9. Classify this number. Write ALL sets it belongs to:

$\frac{3}{4}$

→ *3/4 is a ratio of two integers → Rational.*
→ *Not a whole number or integer.*
→ *All rationals are Real.*

Answer: Rational, Real

---

10. Evaluate the absolute value:

$|-15|$

→ *Absolute value = distance from zero.*
→ *|-15| = 15*

Answer: 15

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11. Evaluate:

$-|-9| + |4|$

→ *|-9| = 9, so -|-9| = -9*
→ *|4| = 4*
→ *-9 + 4 = -5*

Answer: -5

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12. Evaluate:

$|3 - 10|$

→ *Simplify inside: 3 - 10 = -7*
→ *|-7| = 7*

Answer: 7

---

13. Arrange from least to greatest:

$-\frac{1}{2},\quad 0.6,\quad -0.75,\quad \frac{1}{4}$

→ *Convert to decimals: -0.5, 0.6, -0.75, 0.25*
→ *Order: -0.75 < -0.5 < 0.25 < 0.6*

Answer: $-0.75 < -\frac{1}{2} < \frac{1}{4} < 0.6$

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14. Place < , > , or = between the two numbers:

- dfrac 3 4 quad underline hspace 1cm quad -0.8

→ *-3/4 = -0.75*
→ *Compare: -0.75 vs -0.8*
→ *-0.75 is further right on the number line → -3/4 > -0.8*

Answer: $-\frac{3}{4} > -0.8$

---

15. Convert the fraction to a decimal:

$\frac{5}{8}$

→ *Divide: 5 ÷ 8 = 0.625*

Answer: 0.625

---

16. Convert the fraction to a decimal:

$\frac{7}{9}$

→ *Divide: 7 ÷ 9 = 0.777... = 0.7 repeating*

Answer: $0.\overline{7}$

---

17. Convert the fraction to a decimal:

$\frac{11}{4}$

→ *11 ÷ 4 = 2 remainder 3*
→ *2 + 3/4 = 2.75*

Answer: 2.75

18. Simplify (combines PEMDAS + absolute value):

$2 \times |-6| - 3^2 + 1$

→ *|-6| = 6*
→ *$3^2 = 9$*
→ *$2 \times 6 = 12$*
→ *$12 - 9 + 1 = 4$*

Answer: 4

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19. True or False: Every integer is a rational number. Explain.

True or False? $\mathbb{Z} \subseteq \mathbb{Q}$

→ *Any integer n can be written as n/1.*
→ *A ratio of two integers is rational by definition.*
→ *So every integer is also rational. TRUE.*

Answer: TRUE

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20. A submarine is at -340 ft. It rises 185 ft, then descends 60 ft. What is its final depth?

$-340 + 185 - 60$

→ *-340 + 185 = -155*
→ *-155 - 60 = -215*
→ *Final depth: -215 ft*

Answer: -215 ft