

Whole Numbers & Negative Numbers: Concepts, Examples, and Tests

Master basic math skills: place value, operations, negatives, coordinates, and more!

Concepts

Examples

Pre-Test

Q & A

Post-Test

Concepts Explained

1. Place Value

Each digit in a whole number has a value based on its position. For example, in 4,573:

- 4 is in the thousands place (4,000)
- 5 is in the hundreds place (500)
- 7 is in the tens place (70)
- 3 is in the ones place (3)

2. Adding & Subtracting Whole Numbers

Addition joins two or more numbers.

Subtraction finds the difference between two numbers.

3. Estimating Sums & Differences

Estimation makes calculations easier by rounding numbers. For example, $397 + 624$ can be estimated as $400 + 600 = 1,000$.

4. Multiplying Whole Numbers & Estimating Products

Multiplication is repeated addition. Estimation uses rounded numbers (e.g., $49 \times 21 \approx 50 \times 20 = 1,000$).

5. Dividing Whole Numbers & Estimating Quotients

Division splits a number into equal groups. Estimation helps check your answer (e.g., $198 \div 4 \approx 200 \div 4 = 50$).

6. Negative Numbers

Numbers less than zero (e.g., -5). Useful for temperatures, elevations, and finances.

7. Adding with Negative Numbers

When adding a negative, you move left on the number line. For example, $7 + (-3) = 4$.

8. Absolute Value

The distance a number is from zero. Always positive. E.g., $|-6| = 6$.

9. Plotting Ordered Pairs

Ordered pairs (x, y) show positions on a coordinate plane. $(3, 2)$ means 3 units right, 2 units up from the origin.

10. Distance

The straight-line length between two points. On a number line, it's the absolute difference. On a grid, use the Pythagorean theorem if needed.

Examples

- **Place Value:** In 5,204, the digit 2 is in the hundreds place (value: 200).
- **Addition:** $867 + 235 = 1,102$.
- **Subtraction:** $500 - 187 = 313$.
- **Estimating Sums:** $678 + 147 \approx 700 + 150 = 850$.
- **Multiplication:** $24 \times 6 = 144$.
- **Estimating Products:** $38 \times 19 \approx 40 \times 20 = 800$.
- **Division:** $96 \div 8 = 12$.
- **Estimating Quotients:** $205 \div 9 \approx 210 \div 10 = 21$.
- **Negative Numbers:** -7 is 7 units to the left of 0 on a number line.
- **Adding with Negatives:** $5 + (-9) = -4$.
- **Absolute Value:** $|-15| = 15$.
- **Plotting Ordered Pairs:** Plot $(-2, 3)$: move 2 units left and 3 units up from the origin.
- **Distance on a Number Line:** Between -3 and 4 : $|4 - (-3)| = |7| = 7$.

Pre-Test (40 Questions)

Q1. What is the value of the 6 in 6,427?

- 6
- 600
- 6,000
- 60

Q2. What is $6 + (-8)$?

- 14
- 14
- 2
- 2

Q3. What is the absolute value of 0?

- 0
- 1
- 1
- 10

Q4. Plot $(-3, 5)$. What is the y-coordinate?

- 3
- 5
- 3
- 5

Q5. Estimate: $394 + 218 \approx$

- 600
- 700
- 500
- 800

Q6. What is the opposite of -6?

- 6
- 12
- 0
- 3

Q7. What is $|-14|$?

- 14
- 14
- 0
- 7

Q8. Multiply: $23 \times 5 = ?$

- 115
- 120
- 110
- 105

Q9. In $(-2, 4)$, what is the x-coordinate?

- 2
- 4
- 2
- 4

Q10. Estimate: $250 \div 6 \approx$

- 40
- 42
- 45
- 50

Q11. Estimate: $32 \times 29 \approx$

- 900
- 800
- 1,000
- 950

Q12. Find the distance between -8 and 3 .

- 5
- 10
- 11

8

Q13. What is the opposite of 9?

-9

9

0

-1

Q14. Which digit is in the tens place of 4,978?

9

7

8

4

Q15. Which is NOT a negative number?

-7

-2

0

-11

Q16. Divide: $144 \div 12 = ?$

12

14

10

13

Q17. Find the sum: $-7 + 9 = ?$

-2

2

-16

16

Q18. What is the absolute value of 7?

- 7
- 7
- 0
- 14

Q19. Find the distance between -3 and 2.

- 5
- 4
- 3
- 6

Q20. What is $144 \div 8$?

- 20
- 18
- 17
- 16

Q21. Estimate: $856 - 399 \approx$

- 400
- 500
- 450
- 600

Q22. Add: $379 + 618 = ?$

- 997
- 987
- 995
- 1007

Q23. Multiply: $34 \times 3 = ?$

- 102
- 105

99

97

Q24. Divide: $180 \div 9 = ?$

16

18

20

15

Q25. What is the distance between 2 and -5 on a number line?

7

3

5

2

Q26. In 8,392, what place is the 9 in?

Tens

Hundreds

Thousands

Ones

Q27. Estimate: $399 \div 8 \approx$

50

60

40

55

Q28. What is the x-coordinate in $(4, -2)$?

-2

4

2

0

Q29. Estimate: $202 \div 9 \approx$

- 20
- 22
- 18
- 19

Q30. Plot $(5, -2)$. What is the y-coordinate?

- 2
- 5
- 2
- 5

Q31. Estimate: $61 \times 8 \approx$

- 480
- 500
- 490
- 520

Q32. What is $1,200 - 689$?

- 511
- 521
- 501
- 411

Q33. Estimate: $387 + 614 \approx$

- 900
- 1,000
- 1,100
- 990

Q34. What is the distance between 10 and 4?

- 14
- 6

5

4

Q35. What is $72 \div 6$?

11

10

12

13

Q36. Estimate: $125 \div 4 \approx$

30

32

28

34

Q37. Subtract: $903 - 478 = ?$

425

435

415

423

Q38. Estimate: $741 - 298 \approx$

400

500

450

600

Q39. What is $8 + (-5)$?

13

3

-3

5

Q40. What is the value of the 5 in 2,154?

- 50
- 5
- 500
- 5,000

Submit

Questions & Answers from Your Pre-Test

Answer the Pre-Test to see questions and answers here!

Post-Test (40 Questions)

Q1. Estimate: $125 \div 4 \approx$

- 30
- 32
- 28
- 34

Q2. What is the absolute value of 7?

- 7
- 7
- 0
- 14

Q3. What is $144 \div 8$?

- 20
- 18
- 17
- 16

Q4. What is $1,200 - 689$?

- 511

- 521
- 501
- 411

Q5. What is $574 + 219$?

- 783
- 793
- 813
- 800

Q6. What is $|-14|$?

- 14
- 14
- 0
- 7

Q7. In $(-2, 4)$, what is the x-coordinate?

- 2
- 4
- 2
- 4

Q8. What is 16×12 ?

- 172
- 192
- 182
- 196

Q9. Find the distance between -8 and 3 .

- 5
- 10
- 11
- 8

Q10. Multiply: $23 \times 5 = ?$

- 115
- 120
- 110
- 105

Q11. Estimate: $32 \times 29 \approx$

- 900
- 800
- 1,000
- 950

Q12. Estimate: $387 + 614 \approx$

- 900
- 1,000
- 1,100
- 990

Q13. What is the opposite of 9?

- 9
- 9
- 0
- 1

Q14. Which is NOT a negative number?

- 7
- 2
- 0
- 11

Q15. In 8,392, what place is the 9 in?

- Tens
- Hundreds
- Thousands
- Ones

Q16. Plot $(5, -2)$. What is the y-coordinate?

- 2
- 5
- 2
- 5

Q17. What is $8 + (-5)$?

- 13
- 3
- 3
- 5

Q18. Plot $(-3, 5)$. What is the y-coordinate?

- 3
- 5
- 3
- 5

Q19. Estimate: $856 - 399 \approx$

- 400
- 500
- 450
- 600

Q20. Divide: $180 \div 9 = ?$

- 16
- 18
- 20

15

Q21. Estimate: $61 \times 8 \approx$

480

500

490

520

Q22. Find the distance between -3 and 2 .

5

4

3

6

Q23. Subtract: $903 - 478 = ?$

425

435

415

423

Q24. Estimate: $47 \times 19 \approx$

900

800

1,000

950

Q25. What is 15×7 ?

105

115

120

95

Q26. What is the x-coordinate in $(4, -2)$?

- 2
- 4
- 2
- 0

Q27. Which digit is in the tens place of 4,978?

- 9
- 7
- 8
- 4

Q28. Divide: $144 \div 12 = ?$

- 12
- 14
- 10
- 13

Q29. What is the absolute value of 0?

- 0
- 1
- 1
- 10

Q30. Add: $379 + 618 = ?$

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7

3

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2

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450

600

Q34. What is $|-20|$?

20

-20

0

10

Q35. What is the opposite of -6 ?

6

-12

0

-3

Q36. Estimate: $202 \div 9 \approx$

20

22

18

19

Q37. What is the value of the 6 in 6,427?

- 6
- 600
- 6,000
- 60

Q38. Which is a negative number?

- 7
- 0
- 3
- 3

Q39. What is $-4 + (-5)$?

- 9
- 9
- 1
- 1

Q40. What is the distance between 10 and 4?

- 14
- 6
- 5
- 4

Submit

Arithmetic of Fractions: Complete Course

Chapter 1

Chapter 2

Chapter 3

Pre-Test

Corrections

Post-Test

Chapter 1: Whole Numbers, Place Value, Absolute Value, and Distance

What is a Whole Number?

A **whole number** is any of the numbers 0, 1, 2, 3, 4, . . .

What is Place Value?

Place value is the value of where a digit is in a number. For example, in 4,582:

- 4 is in the thousands place (value: 4,000).
- 5 is in the hundreds place (value: 500).
- 8 is in the tens place (value: 80).
- 2 is in the ones place (value: 2).

What is Absolute Value?

The **absolute value** of a number is its distance from zero on the number line, regardless of direction.

Example: The absolute value of -7 is 7. The absolute value of 5 is 5.

Mathematical notation: $|-7| = 7$, $|5| = 5$

What is Distance (on the Number Line)?

Distance between two numbers is the absolute value of their difference.

Example: The distance between 3 and -4 is $|3 - (-4)| = |3 + 4| = 7$.

Chapter 2: Arithmetic of Fractions (Explanations)

1. Changing Improper Fractions to Mixed Numbers:

Divide the numerator by the denominator. The quotient is the whole number, and the remainder over the denominator is the fraction part.

Example: $\frac{11}{3} = 3\frac{2}{3}$

2. Changing Mixed Numbers to Improper Fractions:

Multiply the whole number by the denominator, add the numerator, and put the result over the denominator.

Example: $2\frac{5}{6} = \frac{2 \times 6 + 5}{6} = \frac{17}{6}$

3. Adding Fractions with Like Denominators:

Add the numerators, keep the same denominator.

Example: $\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$

4. Subtracting Fractions with Like Denominators:

Subtract the numerators, keep the same denominator.

Example: $\frac{7}{10} - \frac{3}{10} = \frac{4}{10} = \frac{2}{5}$

5. Adding or Subtracting Fractions with Unlike Denominators:

Find a common denominator, rewrite each fraction, then add or subtract.

Example: $\frac{1}{4} + \frac{1}{6} = \frac{3}{12} + \frac{2}{12} = \frac{5}{12}$

6. Adding Mixed Numbers with Unlike Denominators:

Convert mixed numbers to improper fractions or add whole numbers and fractions separately (after finding a common denominator).

Example: $1\frac{1}{2} + 2\frac{2}{3} = \frac{3}{2} + \frac{8}{3} = \frac{9}{6} + \frac{16}{6} = \frac{25}{6} = 4\frac{1}{6}$

7. Subtracting Mixed Numbers with Unlike Denominators:

Find a common denominator, borrow if necessary, then subtract.

Example: $3\frac{1}{4} - 1\frac{1}{2} = \frac{13}{4} - \frac{3}{2} = \frac{13}{4} - \frac{6}{4} = \frac{7}{4} = 1\frac{3}{4}$

8. Estimating Sums and Differences of Fractions and Mixed Numbers:

Round each fraction or mixed number to the nearest whole number or benchmark fraction, then add or subtract.

Example: $2\frac{5}{6} \approx 3$, $1\frac{1}{4} \approx 1$, so $2\frac{5}{6} + 1\frac{1}{4} \approx 4$

9. Multiplying Fractions and Whole Numbers:

Multiply the whole number by the numerator, keep the denominator.

Example: $4 \times \frac{3}{5} = \frac{12}{5} = 2\frac{2}{5}$

10. Multiplying Fractions: Reciprocals:

The reciprocal of $\frac{a}{b}$ is $\frac{b}{a}$. Multiplying a number by its reciprocal gives 1.

Example: $\frac{2}{3} \times \frac{3}{2} = 1$

11. Multiplying Fractions and Mixed Numbers: Reducing:

Convert mixed numbers to improper fractions, multiply, and reduce (simplify) the result.

Example: $1\frac{1}{2} \times \frac{4}{9} = \frac{3}{2} \times \frac{4}{9} = \frac{12}{18} = \frac{2}{3}$

12. Dividing Fractions by Whole Numbers:

Multiply by the reciprocal of the whole number.

Example: $\frac{3}{5} \div 2 = \frac{3}{5} \times \frac{1}{2} = \frac{3}{10}$

13. Dividing Whole Numbers by Fractions:

Multiply the whole number by the reciprocal of the fraction.

Example: $4 \div \frac{2}{3} = 4 \times \frac{3}{2} = \frac{12}{2} = 6$

14. Dividing Fractions by Fractions:

Multiply by the reciprocal of the divisor.

Example: $\frac{2}{3} \div \frac{4}{5} = \frac{2}{3} \times \frac{5}{4} = \frac{10}{12} = \frac{5}{6}$

15. Dividing Mixed Numbers:

Convert to improper fractions, then multiply by the reciprocal.

Example: $2\frac{1}{2} \div 1\frac{1}{4} = \frac{5}{2} \div \frac{5}{4} = \frac{5}{2} \times \frac{4}{5} = 2$

16. Ratios:

A ratio compares two quantities, often written as $a : b$, a to b , or $\frac{a}{b}$.

Example: The ratio of 8 to 12 is $8 : 12$ or $2 : 3$.

17. Proportions and Cross-Multiplying:

A proportion is an equation that states two ratios are equal. Cross-multiplying helps solve for unknowns.

Example: If $\frac{a}{b} = \frac{c}{d}$, then $a \times d = b \times c$

18. Ratio Tables:

A table of equivalent ratios.

Example:

2	4	6
6	12	18

19. Rates:

A rate is a ratio comparing two different units.

Example: 60 miles in 2 hours is a rate of 30 miles/hour.

20. Problem-Solving with Proportions:

Use proportions to solve real-world problems, such as finding missing values in similar figures or recipes.

Chapter 3: Examples

Example 1: Change $\frac{17}{5}$ to a mixed number.

$17 \div 5 = 3$ remainder 2, so $3\frac{2}{5}$

Example 2: Add $\frac{2}{3} + \frac{1}{6}$.

LCD is 6: $\frac{2}{3} = \frac{4}{6}$, so $\frac{4}{6} + \frac{1}{6} = \frac{5}{6}$

Example 3: Multiply $3\frac{1}{4}$ by $\frac{2}{5}$.

$3\frac{1}{4} = \frac{13}{4}$, so $\frac{13}{4} \times \frac{2}{5} = \frac{26}{20} = \frac{13}{10} = 1\frac{3}{10}$

Example 4: Divide $\frac{5}{6} \div \frac{1}{4}$.

Multiply by reciprocal: $\frac{5}{6} \times \frac{4}{1} = \frac{20}{6} = \frac{10}{3} = 3\frac{1}{3}$

Example 5: What is the rate if you run 15 miles in 3 hours?
 $15 \div 3 = 5$, so the rate is 5 miles per hour.

Example 6: Estimate: $4\frac{3}{4} + 2\frac{2}{5} \approx 5 + 2 = 7$

Chapter 4: Pre-Test (Auto-Graded, 40 Questions)

1. Change $\frac{9}{4}$ to a mixed number.

- $2\frac{1}{4}$
- $2\frac{2}{5}$
- $1\frac{5}{4}$
- $2\frac{1}{2}$

2. Write $3\frac{2}{5}$ as an improper fraction.

- $\frac{17}{5}$
- $\frac{15}{7}$
- $\frac{8}{5}$
- $\frac{7}{2}$

3. Add $\frac{7}{8} + \frac{1}{8}$.

- $\frac{8}{16}$
- 1
- $\frac{8}{8}$
- $\frac{7}{16}$

4. Subtract $\frac{9}{10} - \frac{2}{10}$.

- $\frac{7}{10}$
- $\frac{11}{10}$
- $\frac{9}{8}$

$\frac{1}{5}$

5. Add $\frac{1}{3} + \frac{1}{4}$.

$\frac{2}{7}$

$\frac{2}{12}$

$\frac{7}{12}$

$\frac{5}{12}$

6. Subtract $2\frac{1}{4} - 1\frac{2}{3}$.

$\frac{7}{12}$

$1\frac{5}{12}$

$\frac{5}{12}$

$\frac{1}{12}$

7. Estimate $3\frac{3}{5} + 1\frac{1}{2}$.

5

6

4

8

8. Multiply $2 \times \frac{5}{7}$.

$\frac{10}{7}$

$\frac{7}{10}$

$\frac{12}{14}$

$\frac{5}{14}$

9. What is the reciprocal of $\frac{3}{8}$?

$\frac{8}{3}$

$\frac{3}{8}$

$\frac{5}{8}$

$\frac{1}{3}$

10. Divide $\frac{5}{6} \div 2$.

$\frac{5}{12}$

$\frac{5}{3}$

$\frac{2}{5}$

$\frac{10}{6}$

11. Change $\frac{13}{5}$ to a mixed number.

$2\frac{3}{5}$

$2\frac{2}{5}$

$1\frac{3}{5}$

$3\frac{2}{5}$

12. Write $4\frac{1}{2}$ as an improper fraction.

$\frac{9}{2}$

$\frac{8}{2}$

$\frac{7}{2}$

$\frac{10}{2}$

13. Add $\frac{5}{6} + \frac{1}{3}$.

$\frac{7}{6}$

$\frac{6}{9}$

$\frac{12}{18}$

$\frac{8}{9}$

14. Subtract $\frac{11}{12} - \frac{5}{12}$.

$\frac{6}{12}$

$\frac{16}{12}$

$\frac{6}{24}$

$\frac{8}{12}$

15. Multiply $3 \times \frac{2}{9}$.

- $\frac{6}{9}$
 $\frac{9}{2}$
 $\frac{2}{3}$
 $\frac{6}{27}$

16. Divide $\frac{7}{8} \div \frac{1}{4}$.

- $\frac{7}{2}$
 $\frac{7}{32}$
 $\frac{1}{32}$
 $\frac{11}{12}$

17. Estimate $5\frac{1}{3} - 2\frac{2}{5}$.

- 3
 4
 2
 6

18. What is the reciprocal of $\frac{5}{6}$?

- $\frac{6}{5}$
 $\frac{5}{6}$
 $\frac{1}{5}$
 $\frac{1}{6}$

19. Solve: $4 : 10 = 6 : x$. **What is x?**

- 15
 12
 10

20

20. What is the distance between -3 and 4?

7

1

4

3

21. What is $|-8|$?

8

-8

0

-1

22. Find the sum: $1\frac{3}{4} + 2\frac{2}{4}$.

$4\frac{1}{2}$

$3\frac{1}{2}$

3

4

23. Which is equal to $2\frac{5}{8}$?

$\frac{21}{8}$

$\frac{13}{8}$

$\frac{17}{8}$

$\frac{18}{8}$

24. Reduce $\frac{12}{16}$.

$\frac{3}{4}$

$\frac{6}{8}$

$\frac{1}{2}$

$\frac{2}{3}$

25. What is $0 \div 5$?

0

5

Undefined

1

26. Find the LCD for $\frac{3}{4}$ and $\frac{2}{5}$.

20

8

9

16

27. What is $\frac{2}{5} + \frac{1}{2}$?

$\frac{9}{10}$

$\frac{3}{7}$

$\frac{7}{10}$

$\frac{1}{10}$

28. Simplify $\frac{15}{45}$.

$\frac{1}{3}$

$\frac{1}{2}$

$\frac{3}{15}$

$\frac{5}{7}$

29. What is $\frac{3}{7} \times \frac{14}{9}$?

$\frac{2}{3}$

$\frac{42}{63}$

$\frac{1}{2}$

$\frac{6}{7}$

30. Find $1\frac{1}{3} + 2\frac{2}{3}$.

4

$3\frac{1}{3}$

$4\frac{1}{3}$

3

31. Subtract $\frac{5}{8} - \frac{1}{4}$.

$\frac{3}{8}$

$\frac{1}{2}$

$\frac{2}{8}$

$\frac{5}{4}$

32. Multiply $3\frac{1}{2} \times 2$.

7

6

5

3

33. What is $\frac{4}{7} \div \frac{2}{7}$?

2

1

$\frac{2}{7}$

$\frac{4}{14}$

34. Write $5\frac{3}{10}$ as an improper fraction.

$\frac{53}{10}$

$\frac{43}{10}$

$\frac{15}{10}$

$\frac{50}{10}$

35. What is $4\frac{1}{6} - 2\frac{2}{3}$?

$1\frac{1}{2}$

$1\frac{1}{3}$

$1\frac{5}{6}$

2

36. Find the value: 0.75 as a fraction.

$\frac{3}{4}$

$\frac{4}{3}$

$\frac{2}{3}$

$\frac{1}{4}$

37. If $\frac{2}{3} = \frac{x}{12}$, what is x?

8

6

9

10

38. Simplify $\frac{18}{27}$.

$\frac{2}{3}$

$\frac{3}{2}$

$\frac{6}{9}$

$\frac{1}{3}$

39. What is the sum: $\frac{3}{10} + \frac{2}{5}$?

$\frac{7}{10}$

$\frac{5}{10}$

$\frac{1}{2}$

$\frac{9}{10}$

40. What is $\frac{2}{9} \div \frac{1}{3}$?

$\frac{2}{3}$

$\frac{3}{2}$

$\frac{2}{9}$

$\frac{3}{9}$

Submit Pre-Test

Chapter 5: Step-by-Step Corrections (Pre-Test)

Chapter 6: Post-Test (Auto-Graded, 40 Questions)

1. Change $\frac{9}{4}$ to a mixed number.

2. Write $3\frac{2}{5}$ as an improper fraction.

3. Add $\frac{7}{8} + \frac{1}{8}$.

4. Subtract $\frac{9}{10} - \frac{2}{10}$.

5. Add $\frac{1}{3} + \frac{1}{4}$.

6. Subtract $2\frac{1}{4} - 1\frac{2}{3}$.

7. Estimate $3\frac{3}{5} + 1\frac{1}{2}$.

8. Multiply $2 \times \frac{5}{7}$.

9. What is the reciprocal of $\frac{3}{8}$?

10. Divide $\frac{5}{6} \div 2$.

Submit Post-Test

Decimals, Fractions, and Percents: Concepts & Practice

Your guide to mastering decimals, fractions, and percents!

Concepts

Examples

Pre-Test

Q & A

Post-Test

Chapter 1: Key Concepts

- **Decimal Place Value and Rounding:** Place value tells us the value of each digit in a decimal number. For example, in 3.472, the 4 is in the tenths place, the 7 in the hundredths, and the 2 in the thousandths.
Rounding means making a number simpler but keeping its value close to what it was (e.g., 4.678 rounded to the nearest tenth is 4.7).
- **Changing Fractions to Decimals:** Divide the numerator by the denominator. Example: $\frac{3}{4} = 0.75$.
- **Changing Decimals to Fractions:** Write the decimal as a fraction with the correct place value, then simplify. Example: $0.6 = \frac{6}{10} = \frac{3}{5}$.
- **Comparing and Ordering Decimals:** Line up the decimal points and compare digit by digit from left to right.
- **Adding & Subtracting Decimals:** Line up the decimal points and add or subtract as usual.
- **Adding & Subtracting Money:** Treat as decimals (e.g., $\$3.50 + \2.45).
- **Estimating Decimal Sums and Differences:** Round decimals to the nearest whole or tenth, then add or subtract.
- **Multiplying Decimals & Money:** Multiply as whole numbers, then count total decimal places in the factors for the answer.
- **Estimating Decimal Products:** Round decimals to whole numbers before multiplying.
- **Dividing Decimals:** For dividing by whole numbers, divide as usual; for dividing by decimals, move the decimal to make the divisor a whole number, and do the same to the dividend.
- **Dividing Money:** Treat as decimals (e.g., $\$6.00 \div 4 = \1.50).
- **Estimating Decimal Quotients:** Round numbers before dividing.
- **Understanding Percent:** Percent means "per 100." So, 45% means 45 out of 100, or 0.45.

- **Percents and Fractions:** To turn a percent into a fraction, put it over 100 and simplify. Example: $60\% = 60/100 = 3/5$.
- **Percents and Decimals:** To turn a percent into a decimal, divide by 100 or move the decimal point two places left. Example: $8\% = 0.08$.
- **Multiplying Percents and Fractions:** Change the percent to a decimal or fraction, then multiply as usual.

Chapter 2: Examples

- **Decimal Place Value and Rounding:** Round 5.678 to the nearest tenth: **5.7**
- **Changing Fractions to Decimals:** $2/5 = 2 \div 5 = \mathbf{0.4}$
- **Changing Decimals to Fractions:** $0.25 = 25/100 = \mathbf{1/4}$
- **Comparing and Ordering Decimals:** Order: 0.3, 0.21, 0.15, 0.04 → **0.04, 0.15, 0.21, 0.3**
- **Adding Decimals:** $1.25 + 2.36 = \mathbf{3.61}$
- **Subtracting Decimals:** $5.6 - 2.47 = \mathbf{3.13}$
- **Adding and Subtracting Money:** $\$4.75 + \$2.15 = \mathbf{\$6.90}$
- **Estimating Decimal Sums and Differences:** Estimate $2.47 + 3.68 \approx 2.5 + 3.7 = \mathbf{6.2}$
- **Multiplying Decimals:** $0.4 \times 0.6 = \mathbf{0.24}$
- **Multiplying Money:** $\$8.25 \times 3 = \mathbf{\$24.75}$
- **Estimating Decimal Products:** Estimate $6.8 \times 3.2 \approx 7 \times 3 = \mathbf{21}$
- **Dividing Decimals by Whole Numbers:** $7.2 \div 3 = \mathbf{2.4}$
- **Dividing Whole Numbers by Decimals:** $6 \div 0.2 = \mathbf{30}$
- **Dividing Decimals by Decimals:** $0.8 \div 0.4 = \mathbf{2}$
- **Dividing Money:** $\$9.60 \div 4 = \mathbf{\$2.40}$
- **Estimating Decimal Quotients:** Estimate $5.4 \div 2.8 \approx 5 \div 3 = \mathbf{1.67}$
- **Understanding Percent:** 45% of 200 = $0.45 \times 200 = \mathbf{90}$
- **Percents and Fractions:** $80\% = 80/100 = \mathbf{4/5}$
- **Percents and Decimals:** $12\% = \mathbf{0.12}$
- **Multiplying Percents and Fractions:** 50% of $2/3 = 0.5 \times 2/3 = \mathbf{1/3}$

Chapter 3: Pre-Test (40 Questions)

Q1. What is the value of the digit 6 in 7.684?

- A. 6
- B. 6 tenths
- C. 6 hundredths
- D. 6 thousandths

Q2. Round 8.456 to the nearest tenth.

- A. 8.4
- B. 8.45
- C. 8.5
- D. 8.46

Q3. Convert $\frac{3}{8}$ to a decimal.

- A. 0.28
- B. 0.375
- C. 0.38
- D. 0.33

Q4. Write 0.75 as a fraction.

- A. $\frac{3}{4}$
- B. $\frac{7}{10}$
- C. $\frac{1}{4}$
- D. $\frac{5}{8}$

Q5. Which is greater: 0.56 or 0.506?

- A. 0.56
- B. 0.506
- C. They are equal
- D. Cannot compare

Q6. Arrange from least to greatest: 0.45, 0.54, 0.405.

- A. 0.405, 0.45, 0.54
- B. 0.45, 0.405, 0.54
- C. 0.54, 0.45, 0.405
- D. 0.405, 0.54, 0.45

Q7. $1.27 + 3.89 = ?$

- A. 4.16
- B. 5.16
- C. 5.06
- D. 4.96

Q8. $5.06 - 2.78 = ?$

- A. 2.38
- B. 2.28
- C. 2.29
- D. 2.18

Q9. $\$4.25 + \$3.10 = ?$

- A. \$7.35
- B. \$7.25
- C. \$8.35
- D. \$7.15

Q10. $\$9.55 - \$7.40 = ?$

- A. \$2.15
- B. \$1.95
- C. \$2.25
- D. \$2.05

Q11. Estimate $3.76 + 4.14$.

- A. 7.9
- B. 8.0
- C. 7.8
- D. 8.5

Q12. Estimate $8.32 - 2.97$.

- A. 5.3
- B. 5.5
- C. 5.4
- D. 5.0

Q13. $0.7 \times 0.5 = ?$

- A. 0.35
- B. 0.12
- C. 0.32
- D. 0.25

Q14. $6.2 \times 2.1 = ?$

- A. 13.02
- B. 12.02
- C. 13.12
- D. 12.21

Q15. $\$5.50 \times 6 = ?$

- A. \$33.00
- B. \$32.00
- C. \$30.00
- D. \$36.00

Q16. Estimate 7.9×3.2 .

- A. 24
- B. 21
- C. 25
- D. 23

Q17. $9.6 \div 4 = ?$

- A. 2.4
- B. 2.5
- C. 2.6
- D. 2.3

Q18. $8 \div 0.4 = ?$

- A. 20
- B. 2
- C. 16
- D. 32

Q19. $0.6 \div 0.3 = ?$

- A. 0.2
- B. 2
- C. 0.5
- D. 3

Q20. $\$12.60 \div 3 = ?$

- A. \$4.20
- B. \$4.30
- C. \$4.50
- D. \$4.10

Q21. Estimate $11.7 \div 2.9$.

- A. 4
- B. 3
- C. 5
- D. 2

Q22. What is 30% of 300?

- A. 60
- B. 30
- C. 90
- D. 100

Q23. Write 65% as a fraction.

- A. $\frac{13}{20}$
- B. $\frac{65}{100}$
- C. $\frac{7}{10}$
- D. $\frac{13}{25}$

Q24. Write 25% as a decimal.

- A. 0.25
- B. 0.02
- C. 2.5
- D. 0.252

Q25. What is 20% of $\frac{3}{5}$?

- A. $\frac{1}{5}$
- B. $\frac{1}{3}$
- C. $\frac{2}{15}$
- D. $\frac{3}{25}$

Q26. What is the hundredths place in 4.372?

- A. 7
- B. 2
- C. 3
- D. 4

Q27. Round 2.985 to the nearest hundredth.

- A. 2.98
- B. 2.99
- C. 2.90
- D. 2.95

Q28. Convert $\frac{1}{5}$ to a decimal.

- A. 0.15
- B. 0.2
- C. 0.5
- D. 0.25

Q29. Write 0.8 as a fraction.

- A. $\frac{8}{10}$
- B. $\frac{4}{5}$
- C. $\frac{2}{5}$
- D. Both A and B

Q30. Which is smaller: 0.62 or 0.602?

- A. 0.62
- B. 0.602
- C. They are equal
- D. Cannot compare

Q31. Arrange: 0.18, 0.81, 0.108 in ascending order.

- A. 0.108, 0.18, 0.81
- B. 0.18, 0.81, 0.108
- C. 0.81, 0.18, 0.108
- D. 0.108, 0.81, 0.18

Q32. $2.45 + 5.67 = ?$

- A. 7.12
- B. 8.12
- C. 8.02
- D. 7.92

Q33. $7.98 - 4.39 = ?$

- A. 3.59
- B. 3.69
- C. 3.79
- D. 3.89

Q34. $\$3.75 + \$2.50 = ?$

- A. \$5.75
- B. \$6.25
- C. \$6.15
- D. \$5.85

Q35. $\$8.00 - \$3.25 = ?$

- A. \$4.85
- B. \$4.75
- C. \$5.75
- D. \$5.85

Q36. Estimate $6.29 + 1.81$.

- A. 8.1
- B. 8.0
- C. 9.0
- D. 7.9

Q37. Estimate $5.97 - 2.03$.

- A. 4.0
- B. 3.9
- C. 3.8
- D. 4.2

Q38. $0.9 \times 0.7 = ?$

- A. 0.56
- B. 0.63
- C. 0.72
- D. 0.73

Q39. $3.6 \times 2.5 = ?$

- A. 9.0
- B. 8.5
- C. 9.5
- D. 8.0

Q40. $\$7.20 \times 4 = ?$

- A. \$28.80
- B. \$27.80
- C. \$26.80
- D. \$27.20

Submit Answers

Chapter 4: Questions & Answers

No incorrect questions to review yet. Take the Pre-Test or Post-Test!

Chapter 5: Post-Test (40 Questions)

Q1. What is the value of the digit 9 in 2.913?

- A. 9 tenths
- B. 9 hundredths
- C. 9 thousandths
- D. 9

Q2. Round 6.395 to the nearest hundredth.

- A. 6.39
- B. 6.40
- C. 6.30
- D. 6.50

Q3. Convert $\frac{7}{10}$ to a decimal.

- A. 0.7
- B. 0.07
- C. 0.17
- D. 0.77

Q4. Write 0.2 as a fraction.

- A. $\frac{2}{10}$
- B. $\frac{1}{5}$
- C. Both A and B
- D. $\frac{2}{5}$

Q5. Which is greater: 0.48 or 0.482?

- A. 0.48
- B. 0.482
- C. They are equal

D. Cannot compare

Q6. Arrange in order: 0.31, 0.13, 0.113.

A. 0.113, 0.13, 0.31

B. 0.13, 0.31, 0.113

C. 0.31, 0.13, 0.113

D. 0.113, 0.31, 0.13

Q7. $2.68 + 4.59 = ?$

A. 7.27

B. 7.17

C. 8.27

D. 8.17

Q8. $9.07 - 3.78 = ?$

A. 5.20

B. 5.29

C. 5.30

D. 5.19

Q9. $\$6.25 + \$4.50 = ?$

A. \$10.75

B. \$10.85

C. \$10.55

D. \$11.25

Q10. $\$10.75 - \$7.60 = ?$

A. \$3.15

B. \$3.25

C. \$3.05

D. \$3.10

Q11. Estimate $5.83 + 1.24$.

A. 7.0

B. 7.1

C. 6.9

D. 7.5

Q12. Estimate $7.56 - 2.09$.

A. 5.5

B. 5.0

C. 5.4

D. 6.0

Q13. $0.6 \times 0.9 = ?$

A. 0.54

B. 0.15

C. 0.45

D. 0.36

Q14. $5.4 \times 1.2 = ?$

A. 6.48

B. 6.24

C. 6.18

D. 6.36

Q15. $\$4.70 \times 5 = ?$

A. \$23.50

B. \$24.50

C. \$22.50

D. \$25.50

Q16. Estimate 8.3×2.7 .

A. 22

B. 23

C. 20

D. 24

Q17. $4.8 \div 6 = ?$

A. 0.8

B. 0.6

C. 0.7

D. 0.9

Q18. $4 \div 0.5 = ?$

A. 0.8

B. 8

C. 2

D. 4

Q19. $0.7 \div 0.2 = ?$

A. 3.5

B. 0.35

C. 0.14

D. 2.5

Q20. $\$15.00 \div 5 = ?$

A. \$3.00

B. \$2.50

C. \$3.50

- D. \$2.00

Q21. Estimate $13.5 \div 2.5$.

- A. 5
- B. 6
- C. 7
- D. 4

Q22. What is 75% of 120?

- A. 80
- B. 90
- C. 85
- D. 95

Q23. Write 20% as a fraction.

- A. $1/5$
- B. $1/4$
- C. $1/2$
- D. $2/5$

Q24. Write 80% as a decimal.

- A. 0.80
- B. 0.08
- C. 8.0
- D. 0.008

Q25. What is 50% of $1/4$?

- A. $1/4$
- B. $1/2$
- C. $1/8$

D. $\frac{1}{6}$

Q26. What is the thousandths place in 3.476?

A. 7

B. 6

C. 4

D. 3

Q27. Round 7.499 to the nearest tenth.

A. 7.5

B. 7.4

C. 7.49

D. 7.0

Q28. Convert $\frac{3}{4}$ to a decimal.

A. 0.34

B. 0.75

C. 0.25

D. 0.7

Q29. Write 0.7 as a fraction.

A. $\frac{7}{10}$

B. $\frac{1}{7}$

C. $\frac{10}{7}$

D. $\frac{7}{100}$

Q30. Which is smaller: 0.89 or 0.809?

A. 0.809

B. 0.89

C. They are equal

D. Cannot compare

Q31. Arrange: 0.21, 0.12, 0.102 in ascending order.

A. 0.102, 0.12, 0.21

B. 0.12, 0.102, 0.21

C. 0.21, 0.12, 0.102

D. 0.102, 0.21, 0.12

Q32. $5.84 + 2.17 = ?$

A. 8.01

B. 8.00

C. 8.10

D. 8.11

Q33. $8.95 - 3.61 = ?$

A. 5.24

B. 5.34

C. 5.44

D. 5.54

Q34. $\$5.20 + \$1.90 = ?$

A. \$7.10

B. \$7.00

C. \$6.90

D. \$7.20

Q35. $\$9.30 - \$5.15 = ?$

A. \$4.15

B. \$4.25

C. \$4.05

D. \$4.20

Q36. Estimate $4.29 + 2.71$.

A. 7.0

B. 6.9

C. 7.1

D. 6.8

Q37. Estimate $6.48 - 1.53$.

A. 5.0

B. 5.1

C. 4.9

D. 5.2

Q38. $0.6 \times 0.3 = ?$

A. 0.18

B. 0.09

C. 0.21

D. 0.12

Q39. $2.9 \times 3.5 = ?$

A. 10.15

B. 9.85

C. 9.50

D. 10.10

Q40. $\$5.60 \times 3 = ?$

A. \$16.80

B. \$15.80

C. \$17.8

D. \$16.60

Submit Answers

Fundamentals of Algebra: Concepts & Practice

Exponents, Scientific Notation, Order of Operations, Properties, Factors, Equations, and Inequalities

▼ Chapter 1: Key Concepts

1.1 Exponents

- An **exponent** tells how many times to multiply a number by itself. Example: $(2^3 = 2 \times 2 \times 2 = 8)$.

1.2 Scientific Notation

- Numbers written as $(a \times 10^n)$, where $(1 \leq a < 10)$ and (n) is an integer. Example: $(4,500 = 4.5 \times 10^3)$.

1.3 Order of Operations

- Sequence: Parentheses, Exponents, Multiplication/Division, Addition/Subtraction (PEMDAS).

1.4 Commutative & Associative Properties

- **Commutative:** Order doesn't matter (e.g., $(a + b = b + a)$).
- **Associative:** Grouping doesn't matter (e.g., $((a + b) + c = a + (b + c))$).

1.5 Distributive & Identity Properties

- **Distributive:** $(a(b + c) = ab + ac)$.
- **Identity:** Adding 0 or multiplying by 1 does not change a number.

1.6 Zero & Equality Properties

- **Zero Property:** Any number times 0 is 0.
- **Equality Properties:** If $(a = b)$, then $(a + c = b + c)$, etc.

1.7 Factors & Multiples

- **Factors:** Numbers that divide exactly into another number.
- **Multiples:** Products of a number and an integer.

1.8 Variable Expressions & Equations

- **Variable Expression:** Contains numbers, variables, and operations (e.g., $(3x + 2)$).
- **Equation:** States that two expressions are equal (e.g., $(x + 4 = 10)$).

1.9 Solving Equations & Inequalities

- To solve, use inverse operations to isolate the variable.
- **Inequality:** Compares values (e.g., $(x > 5)$).
- **Substitution:** Plugging a value into a variable to test or solve.

▼ Chapter 2: Examples

- **Exponents:** $(5^2 = 25)$
- **Scientific Notation:** $(0.0008 = 8 \times 10^{-4})$
- **Order of Operations:** $(6 + 2 \times 3^2 = 6 + 2 \times 9 = 6 + 18 = 24)$
- **Commutative:** $(7 + 2 = 2 + 7)$
- **Associative:** $((1 + 2) + 3 = 1 + (2 + 3))$
- **Distributive:** $(3(x + 4) = 3x + 12)$
- **Identity:** $(9 \times 1 = 9)$
- **Zero Property:** $(17 \times 0 = 0)$
- **Factors:** Factors of 12: 1, 2, 3, 4, 6, 12
- **Multiples:** Multiples of 4: 4, 8, 12, 16, ...
- **Variable Expression:** If $(x = 5)$, then $(2x + 3 = 2 \times 5 + 3 = 13)$
- **Solving by Addition:** $(x - 5 = 7) \Rightarrow (x = 12)$
- **Solving by Multiplication:** $(\frac{x}{3} = 4) \Rightarrow (x = 12)$
- **Inequality:** $(x + 2 > 5) \Rightarrow (x > 3)$

- **Substitution:** If $(y = 3)$, in $(2y + 1) \Rightarrow (2 \times 3 + 1 = 7)$

▼  Chapter 3: Pre-Test (Auto-Graded Multiple Choice)

1. What is 2^4 ?

- a) 6
- b) 8
- c) 16
- d) 24

2. What is 25,000 in scientific notation?

- a) 2.5×10^3
- b) 2.5×10^4
- c) 25×10^3
- d) 0.25×10^5

3. Solve: $3 + 6 \times 2$

- a) 18
- b) 21
- c) 15
- d) 27

4. Is $a + b = b + a$ always true?

- a) Yes, for addition
- b) No, never
- c) Only for subtraction
- d) Only for positive numbers

5. What is the distributive property?

- a) $a + b = b + a$
- b) $a(b + c) = ab + ac$
- c) $(a + b) + c = a + (b + c)$
- d) $a \times 0 = 0$

6. What is the identity property of addition?

- a) $a + 1 = a$
- b) $a + 0 = a$
- c) $a \times 1 = a$
- d) $a \times 0 = 0$

7. What is 0×45 ?

- a) 0
- b) 45
- c) 1
- d) None of these

8. Which is NOT a factor of 18?

- a) 2
- b) 3
- c) 4
- d) 9

9. Which is the first multiple of 7?

- a) 7
- b) 0
- c) 14
- d) 21

10. What is a variable expression?

- a) An equation with an equal sign
- b) An expression with numbers and variables
- c) Only numbers
- d) None of these

11. Solve: $x + 5 = 12$

- a) 5
- b) 7
- c) 17
- d) 12

12. Solve: $x/4 = 5$

- a) 9

- b) 20
- c) 1.25
- d) 25

13. Solve: $y - 3 = 10$

- a) 13
- b) 7
- c) 3
- d) 10

14. Is $x > 7$ an equation or inequality?

- a) Equation
- b) Inequality
- c) Both
- d) None of these

15. Substitute $x = 2$ in $4x + 1$

- a) 8
- b) 9
- c) 6
- d) 7

16. Simplify: 10^0

- a) 0
- b) 1
- c) 10
- d) 100

17. What is 0.003 in scientific notation?

- a) 3×10^{-2}
- b) 3×10^{-3}
- c) 0.3×10^{-2}
- d) 30×10^{-4}

18. Solve: $(8 - 3) \times 2$

- a) 10
- b) 12

c) 14

d) 16

19. Is $(a + b) + c = a + (b + c)$ true for all real numbers?

a) Yes

b) No

c) Only for negative numbers

d) Only for positive numbers

20. Expand using distributive property: $2(y + 5)$

a) $2y + 5$

b) $y + 10$

c) $2y + 10$

d) $7y + 5$

21. What is the identity property of multiplication?

a) $a \times 1 = a$

b) $a + 0 = a$

c) $a \times 0 = 0$

d) $1 + a = a$

22. What is 19×0 ?

a) 0

b) 19

c) 1

d) None of these

23. Which is a factor of 24?

a) 5

b) 8

c) 9

d) 13

24. Which is a multiple of 5?

a) 5

b) 7

c) 9

d) 11

25. What is an equation?

a) Statement with an equal sign

b) Statement with a variable

c) Statement with numbers

d) None of these

26. Solve: $y - 8 = 3$

a) 11

b) 5

c) 3

d) 8

27. Solve: $z/7 = 6$

a) 1.16

b) 42

c) 13

d) 7

28. Solve: $a + 4 = 11$

a) 7

b) 15

c) 4

d) 11

29. Which is greater: 5^2 or 3^3 ?

a) Both equal

b) 5^2

c) 3^3

d) Cannot be determined

30. 6,000,000 in scientific notation is:

a) 6×10^5

b) 6×10^6

c) 0.6×10^7

d) 60×10^5

31. Simplify: $7 + (8 \times 2)$

- a) 15
- b) 23
- c) 30
- d) 18

32. Does multiplication have a commutative property?

- a) Yes
- b) No
- c) Only for even numbers
- d) Only for odd numbers

33. Expand: $3(x + 2)$

- a) $3x + 2$
- b) $x + 6$
- c) $3x + 6$
- d) $6x + 2$

34. What is the additive identity?

- a) 1
- b) 0
- c) -1
- d) None

35. What is the product of any number and zero?

- a) That number
- b) Zero
- c) One
- d) Undefined

36. Which is NOT a factor of 15?

- a) 3
- b) 5
- c) 6
- d) 15

37. Which is a multiple of 3?

- a) 5
- b) 6
- c) 7
- d) 8

38. What is a solution to $x + 2 = 10$?

- a) 6
- b) 8
- c) 10
- d) 12

39. Solve: $x/5 = 9$

- a) 14
- b) 45
- c) 9
- d) 5

40. If $x = 4$, what is $2x - 1$?

- a) 7
- b) 8
- c) 9
- d) 5

Submit Test

▼ Chapter 4: Questions & Answers

1. **Q:** What is an exponent?

A: It shows how many times to multiply a number by itself.

2. **Q:** How do you write 5,200 in scientific notation?

A: (5.2×10^3)

3. **Q:** What is PEMDAS?

A: The order of operations: Parentheses, Exponents, Multiplication/Division, Addition/Subtraction.

4. **Q:** What is the commutative property?

A: The order of addition or multiplication does not affect the result.

5. **Q:** What is the distributive property?

A: $a(b + c) = ab + ac$

6. **Q:** What is the zero property?

A: Any number multiplied by 0 is 0.

7. **Q:** What is a factor?

A: A number that divides evenly into another number.

8. **Q:** What is a multiple?

A: A product of a number and any integer.

9. **Q:** What is a variable expression?

A: An expression containing variables, numbers, and operations.

10. **Q:** How do you solve $x + 3 = 7$?

A: Subtract 3 from both sides: $x = 4$.

▼  Chapter 5: Post-Test (Auto-Graded Multiple Choice)

1. What is 3^3 ?

- a) 6
- b) 9
- c) 27
- d) 18

2. What is 0.0009 in scientific notation?

- a) 9×10^{-3}
- b) 9×10^{-4}
- c) 0.9×10^{-3}
- d) 0.09×10^{-5}

3. Calculate: $4 + 5 \times 2$

- a) 18
- b) 14
- c) 20
- d) 28

4. Is $a \times b = b \times a$ always true?

- a) Yes, for multiplication
- b) No, never
- c) Only when $a = b$
- d) Only for even numbers

5. What is the associative property of addition?

- a) $(a + b) + c = a + (b + c)$
- b) $a + b = b + a$
- c) $a(b + c) = ab + ac$
- d) $a \times 1 = a$

6. What is the identity property of multiplication?

- a) $a \times 1 = a$
- b) $a + 0 = a$
- c) $a \times 0 = 0$
- d) $1 + a = a$

7. What is 0×123 ?

- a) 0
- b) 123
- c) 1
- d) None of these

8. Which is NOT a factor of 20?

- a) 4
- b) 5
- c) 7
- d) 10

9. What is the first multiple of 6?

- a) 0
- b) 6
- c) 12
- d) 18

10. What is an equation?

- a) Statement with an equal sign
- b) Statement with a variable
- c) Statement with numbers
- d) None of these

11. Solve: $x + 6 = 15$

- a) 9
- b) 21
- c) 15
- d) 6

12. Solve: $x/2 = 7$

- a) 14
- b) 9
- c) 3.5
- d) 5

13. Solve: $y - 4 = 9$

- a) 5
- b) 13
- c) 4
- d) 9

14. Is $y \leq 2$ an equation or inequality?

- a) Equation
- b) Inequality
- c) Both
- d) None of these

15. Substitute $x = 3$ in $5x - 2$

- a) 15
- b) 13
- c) 8
- d) 7

16. Simplify: 2^5

- a) 10

- b) 25
- c) 32
- d) 16

17. What is 7,000 in scientific notation?

- a) 7×10^2
- b) 7×10^3
- c) 0.7×10^4
- d) 70×10^2

18. Solve: $(10 - 7) \times 3$

- a) 9
- b) 21
- c) 3
- d) 13

19. Is $(a \times b) \times c = a \times (b \times c)$ true?

- a) Yes
- b) No
- c) Only for positive numbers
- d) Only for negative numbers

20. Expand: $4(z + 3)$

- a) $4z + 3$
- b) $z + 12$
- c) $4z + 12$
- d) $7z + 3$

21. What is the additive identity?

- a) 1
- b) 0
- c) -1
- d) None

22. What is 0×56 ?

- a) 0
- b) 56

- c) 1
- d) None of these

23. Which is NOT a factor of 30?

- a) 3
- b) 5
- c) 6
- d) 7

24. Which is a multiple of 8?

- a) 8
- b) 9
- c) 10
- d) 12

25. What is a variable?

- a) A fixed number
- b) A symbol for a number we don't know yet
- c) An operation
- d) None of these

26. Solve: $m - 5 = 11$

- a) 6
- b) 11
- c) 16
- d) 5

27. Solve: $k/3 = 9$

- a) 27
- b) 12
- c) 9
- d) 3

28. Solve: $b + 7 = 13$

- a) 20
- b) 6
- c) 13

d) 7

29. Which is greater: 4^2 or 2^4 ?

a) Both equal

b) 4^2

c) 2^4

d) Cannot be determined

30. What is 0.054 in scientific notation?

a) 5.4×10^{-2}

b) 5.4×10^{-3}

c) 0.54×10^{-1}

d) 54×10^{-4}

31. Simplify: $8 + (3 \times 4)$

a) 20

b) 24

c) 32

d) 14

32. Does addition have an associative property?

a) Yes

b) No

c) Only for even numbers

d) Only for negative numbers

33. Expand: $2(y + 6)$

a) $2y + 6$

b) $y + 12$

c) $2y + 12$

d) $6y + 2$

34. What is the multiplicative identity?

a) 0

b) 1

c) 10

d) -1

35. What is the product of any number and zero?

- a) That number
- b) Zero
- c) One
- d) Undefined

36. Which is a factor of 21?

- a) 5
- b) 7
- c) 8
- d) 12

37. Which is a multiple of 2?

- a) 3
- b) 4
- c) 5
- d) 7

38. What is a solution to $x - 4 = 6$?

- a) 10
- b) 2
- c) 6
- d) 4

39. Solve: $x/8 = 5$

- a) 40
- b) 13
- c) 8
- d) 5

40. If $y = 6$, what is $5y + 1$?

- a) 11
- b) 30
- c) 36
- d) 31

Submit Test

Measurements and Units

Your Complete Guide to Customary and Metric Systems

[Customary Units](#)

[Metric Units](#)

[Unit Conversion](#)

[Examples](#)

[Pre-Test](#)

[Q&A](#)

[Post-Test](#)

Customary Units

Units of Length

- **Inch (in):** Smallest common unit
- **Foot (ft):** $1 \text{ ft} = 12 \text{ in}$
- **Yard (yd):** $1 \text{ yd} = 3 \text{ ft} = 36 \text{ in}$
- **Mile (mi):** $1 \text{ mi} = 1,760 \text{ yd} = 5,280 \text{ ft}$

Units of Liquid Volume

- **Fluid ounce (fl oz):** Smallest common unit
- **Cup (c):** $1 \text{ c} = 8 \text{ fl oz}$
- **Pint (pt):** $1 \text{ pt} = 2 \text{ c} = 16 \text{ fl oz}$
- **Quart (qt):** $1 \text{ qt} = 2 \text{ pt} = 4 \text{ c} = 32 \text{ fl oz}$
- **Gallon (gal):** $1 \text{ gal} = 4 \text{ qt} = 8 \text{ pt} = 16 \text{ c} = 128 \text{ fl oz}$

Units of Weight

- **Ounce (oz):** Smallest common unit
- **Pound (lb):** $1 \text{ lb} = 16 \text{ oz}$

- **Ton (T):** 1 T = 2,000 lb

Perimeter, Area, and Volume

- **Perimeter:** Distance around a 2D shape (e.g., rectangle: $P = 2l + 2w$)
- **Area:** Surface covered (e.g., rectangle: $A = l \times w$)
- **Volume of a Solid:** Space inside (e.g., box: $V = l \times w \times h$)

Time

- Seconds, Minutes, Hours, Days, Weeks, Months, Years
- 1 min = 60 sec; 1 hr = 60 min; 1 day = 24 hr; 1 week = 7 days

Temperature

- Measured in degrees Fahrenheit ($^{\circ}\text{F}$) in the U.S.

Metric Units

Units of Length

- **Millimeter (mm):** 1/1,000 meter
- **Centimeter (cm):** 1/100 meter
- **Meter (m):** Base unit
- **Kilometer (km):** 1,000 meters

Units of Liquid Volume

- **Milliliter (mL):** 1/1,000 liter
- **Liter (L):** Base unit

Units of Mass

- **Milligram (mg):** 1/1,000 gram
- **Gram (g):** Base unit

- **Kilogram (kg):** 1,000 grams
- **Tonne (t):** 1,000 kilograms

Perimeter, Area, and Volume

- **Perimeter:** e.g., rectangle: $P = 2l + 2w$ (units: meters, centimeters, etc.)
- **Area:** e.g., rectangle: $A = l \times w$ (units: m^2 , cm^2 , etc.)
- **Volume of a Solid:** e.g., box: $V = l \times w \times h$ (units: m^3 , cm^3 , etc.)

Temperature

- Measured in degrees Celsius ($^{\circ}C$)

Unit Conversion

Changing from Customary Units to Metric Units

- 1 inch \approx 2.54 centimeters
- 1 foot \approx 0.3048 meter
- 1 yard \approx 0.9144 meter
- 1 mile \approx 1.609 kilometers
- 1 fluid ounce \approx 29.57 milliliters
- 1 gallon \approx 3.785 liters
- 1 ounce \approx 28.35 grams
- 1 pound \approx 0.454 kilogram
- 1 ton \approx 0.907 metric ton
- $^{\circ}F$ to $^{\circ}C$: $(^{\circ}F - 32) \times 5/9$

Changing from Metric Units to Customary Units

- 1 centimeter \approx 0.3937 inch
- 1 meter \approx 3.281 feet
- 1 kilometer \approx 0.6214 mile
- 1 milliliter \approx 0.0338 fluid ounce
- 1 liter \approx 0.2642 gallon

- 1 gram \approx 0.0353 ounce
- 1 kilogram \approx 2.205 pounds
- 1 metric ton \approx 1.102 tons
- $^{\circ}\text{C}$ to $^{\circ}\text{F}$: $(^{\circ}\text{C} \times 9/5) + 32$

Examples

1. Customary Length

If a table is 4 feet long, how many inches is that?

Solution: $4 \text{ ft} \times 12 \text{ in/ft} = \mathbf{48 \text{ inches}}$

2. Metric Mass

A bag of rice weighs 2 kg. How many grams is that?

Solution: $2 \text{ kg} \times 1,000 \text{ g/kg} = \mathbf{2,000 \text{ grams}}$

3. Customary Volume

How many quarts are in 2 gallons?

Solution: $2 \text{ gal} \times 4 \text{ qt/gal} = \mathbf{8 \text{ quarts}}$

4. Metric Area

What is the area of a rectangle 5 m long and 3 m wide?

Solution: $5 \text{ m} \times 3 \text{ m} = \mathbf{15 \text{ m}^2}$

5. Temperature Conversion

Convert 68°F to Celsius:

Solution: $(68 - 32) \times \frac{5}{9} = 36 \times \frac{5}{9} \approx 20^{\circ}\text{C}$

Pre-Test: Measurements and Units

1. How many inches are in a foot?

- 10
- 12
- 14
- 16

2. How many feet are in a yard?

- 2
- 3
- 4
- 5

3. 1 mile is equal to how many feet?

- 1,000
- 5,280
- 2,000
- 3,000

4. Which is longer: 1 yard or 1 meter?

- 1 yard
- 1 meter
- They are the same
- Cannot be compared

5. How many yards are in a mile?

- 1,000
- 1,760

2,000

2,640

6. How many cups are in a pint?

2

4

6

8

7. How many quarts are in a gallon?

2

3

4

5

8. 1 quart equals how many pints?

1

2

3

4

9. How many fluid ounces are in a cup?

6

8

10

12

10. How many pints are in a gallon?

4

6

8

10

11. How many ounces are in a pound?

- 12
- 14
- 16
- 18

12. How many pounds make a ton?

- 1,000
- 1,500
- 2,000
- 2,500

13. Which is heavier: 1 pound or 500 grams?

- 1 pound
- 500 grams
- Equal
- Cannot compare

14. How many ounces are in 2 pounds?

- 12
- 24
- 32
- 36

15. Which unit is used to measure very heavy objects in the US?

- Ounce
- Pound
- Ton
- Gram

16. What is the area of a rectangle with length 5 ft and width 3 ft?

- 8 ft²
- 15 ft²
- 16 ft²

18 ft²

17. Perimeter of a square with 4 m sides?

8 m

12 m

16 m

20 m

18. Volume of a box: 2 ft × 3 ft × 4 ft?

24 ft³

18 ft³

12 ft³

9 ft³

19. How many minutes are in an hour?

30

45

60

90

20. How many hours in 2 days?

24

36

48

72

21. Water freezes at what temperature (F)?

32°F

0°F

100°F

212°F

22. Room temperature is about:

20°C

- 0°C
- 50°C
- 100°C

23. How many centimeters in a meter?

- 10
- 100
- 1,000
- 10,000

24. 1 kilometer equals how many meters?

- 10
- 100
- 1,000
- 10,000

25. Which is longer: 1 cm or 1 mm?

- 1 cm
- 1 mm
- They are equal
- Cannot compare

26. How many millimeters in a centimeter?

- 1
- 10
- 100
- 1,000

27. Which is the base unit of length in the metric system?

- Millimeter
- Centimeter
- Meter
- Kilometer

28. How many milliliters in a liter?

- 10
- 100
- 1,000
- 10,000

29. The base unit for liquid volume in metric is:

- Milliliter
- Centiliter
- Liter
- Gallon

30. A medicine dropper usually holds about:

- 1 mL
- 10 mL
- 100 mL
- 1 L

31. 1 kilogram equals how many grams?

- 100
- 500
- 1,000
- 10,000

32. How many milligrams in a gram?

- 10
- 100
- 1,000
- 10,000

33. Base unit for mass in metric is:

- Milligram
- Gram

Kilogram

Ton

34. Which is heavier: 1 kg or 1,000 g?

1 kg

1,000 g

Same

Cannot compare

35. A square with 10 cm sides has area:

10 cm²

20 cm²

100 cm²

1,000 cm²

36. Box: 2 m × 2 m × 2 m. Volume is:

4 m³

6 m³

8 m³

12 m³

37. 1 inch is about how many centimeters?

1.54

2.54

3.54

4.54

38. 1 kilogram is about how many pounds?

1.2

2.2

3.2

4.2

39. Convert 0°C to Fahrenheit.

- 0°F
- 32°F
- 100°F
- 212°F

40. Convert 100°F to Celsius. (Round to nearest whole number)

- 38°C
- 50°C
- 68°C
- 100°C

Submit Pre-Test

Questions & Answers

Complete the Pre-Test. Any questions you miss will appear here with answers and explanations.

Post-Test: Measurements and Units

1. How many inches are in a foot?

- 10
- 12
- 14
- 16

2. How many feet are in a yard?

- 2
- 3

4

5

3. 1 mile is equal to how many feet?

1,000

5,280

2,000

3,000

4. Which is longer: 1 yard or 1 meter?

1 yard

1 meter

They are the same

Cannot be compared

5. How many yards are in a mile?

1,000

1,760

2,000

2,640

6. How many cups are in a pint?

2

4

6

8

7. How many quarts are in a gallon?

2

3

4

5

8. 1 quart equals how many pints?

- 1
- 2
- 3
- 4

9. How many fluid ounces are in a cup?

- 6
- 8
- 10
- 12

10. How many pints are in a gallon?

- 4
- 6
- 8
- 10

11. How many ounces are in a pound?

- 12
- 14
- 16
- 18

12. How many pounds make a ton?

- 1,000
- 1,500
- 2,000
- 2,500

13. Which is heavier: 1 pound or 500 grams?

- 1 pound
- 500 grams
- Equal

Cannot compare

14. How many ounces are in 2 pounds?

12

24

32

36

15. Which unit is used to measure very heavy objects in the US?

Ounce

Pound

Ton

Gram

16. What is the area of a rectangle with length 5 ft and width 3 ft?

8 ft²

15 ft²

16 ft²

18 ft²

17. Perimeter of a square with 4 m sides?

8 m

12 m

16 m

20 m

18. Volume of a box: 2 ft × 3 ft × 4 ft?

24 ft³

18 ft³

12 ft³

9 ft³

19. How many minutes are in an hour?

30

45

60

90

20. How many hours in 2 days?

24

36

48

72

21. Water freezes at what temperature (F)?

32°F

0°F

100°F

212°F

22. Room temperature is about:

20°C

0°C

50°C

100°C

23. How many centimeters in a meter?

10

100

1,000

10,000

24. 1 kilometer equals how many meters?

10

100

1,000

10,000

25. Which is longer: 1 cm or 1 mm?

- 1 cm
- 1 mm
- They are equal
- Cannot compare

26. How many millimeters in a centimeter?

- 1
- 10
- 100
- 1,000

27. Which is the base unit of length in the metric system?

- Millimeter
- Centimeter
- Meter
- Kilometer

28. How many milliliters in a liter?

- 10
- 100
- 1,000
- 10,000

29. The base unit for liquid volume in metric is:

- Milliliter
- Centiliter
- Liter
- Gallon

30. A medicine dropper usually holds about:

- 1 mL
- 10 mL

100 mL

1 L

31. 1 kilogram equals how many grams?

100

500

1,000

10,000

32. How many milligrams in a gram?

10

100

1,000

10,000

33. Base unit for mass in metric is:

Milligram

Gram

Kilogram

Ton

34. Which is heavier: 1 kg or 1,000 g?

1 kg

1,000 g

Same

Cannot compare

35. A square with 10 cm sides has area:

10 cm²

20 cm²

100 cm²

1,000 cm²

36. Box: 2 m × 2 m × 2 m. Volume is:

- 4 m³
- 6 m³
- 8 m³
- 12 m³

37. 1 inch is about how many centimeters?

- 1.54
- 2.54
- 3.54
- 4.54

38. 1 kilogram is about how many pounds?

- 1.2
- 2.2
- 3.2
- 4.2

39. Convert 0°C to Fahrenheit.

- 0°F
- 32°F
- 100°F
- 212°F

40. Convert 100°F to Celsius. (Round to nearest whole number)

- 38°C
- 50°C
- 68°C
- 100°C

Submit Post-Test

Planar Geometry: Points, Lines, and Figures

[Content](#)

[Examples](#)

[Pre-Test](#)

[Q & A](#)

[Post-Test](#)

Planar Geometry: Points and Lines

- **Points:** A location in space, represented by a dot and labeled with a capital letter.
- **Lines:** Straight paths that extend infinitely in both directions. Named with two points or a lowercase letter.
- **Line Segments:** Part of a line with two endpoints.
- **Rays:** Part of a line with one endpoint, extending infinitely in one direction.

Measuring Angles

- Angles are formed by two rays (sides) with a common endpoint (vertex).
- Measured in degrees ($^{\circ}$) using a protractor.

Types of Angles

- **Acute angle:** $< 90^{\circ}$
- **Right angle:** $= 90^{\circ}$
- **Obtuse angle:** $> 90^{\circ}$ and $< 180^{\circ}$
- **Straight angle:** $= 180^{\circ}$
- **Reflex angle:** $> 180^{\circ}$ and $< 360^{\circ}$

Triangles

- **Equilateral:** All sides and angles equal
- **Isosceles:** Two sides and two angles equal
- **Scalene:** No sides or angles equal
- **Right triangle:** Has one right angle
- **Triangle Sum:** Angles add up to 180°

Quadrilaterals

- **Parallelogram:** Opposite sides parallel
- **Rectangle:** Parallelogram with 4 right angles
- **Square:** Rectangle with all sides equal
- **Rhombus:** Parallelogram with all sides equal

- **Trapezoid:** At least one pair of parallel sides
- **Angles Sum:** 360°

Polygons

- Closed shape with 3 or more straight sides
- **Regular:** All sides and angles equal
- Sum of angles: $(n-2) \times 180^\circ$, where n = number of sides

Circles

- Set of points equidistant from a center
- **Radius:** Center to edge
- **Diameter:** Edge through center to opposite edge ($2 \times$ radius)
- **Circumference:** Distance around ($C = 2\pi r$)
- **Arc, chord, sector:** Parts of a circle

Solid Figures

- **Cube, Rectangular Prism, Cylinder, Sphere, Pyramid, Cone**
- Properties: Faces, edges, vertices

Surface Area

- Sum of the areas of all faces of a solid
- Cube: $6a^2$; Rectangular prism: $2(lw + lh + wh)$
- Cylinder: $2\pi r^2 + 2\pi rh$

Graphing Figures

- Plotting points on a coordinate plane (x, y)
- Measuring distances using the distance formula
- Finding midpoints, slopes, and equations of lines

Examples

1. **Points and Lines:** Plot points A(2, 3) and B(7, 3). Draw line AB.
2. **Line Segment:** If $AB = 5$ units, and A is at (2,3), what are possible coordinates for B?
3. **Measuring Angles:** If $\angle ABC = 65^\circ$, what type of angle is it? (*Acute*)
4. **Types of Angles:** Name angle of 110° . (*Obtuse*)
5. **Triangle:** A triangle has angles 50° , 60° , and _____. Find the missing angle. (70°)

6. **Quadrilateral:** Rectangle sides are 5 cm and 8 cm. Area = ___? (40 cm^2)
7. **Polygon:** What is the sum of angles in a pentagon? (540°)
8. **Circle:** Circle with radius 6 cm. Circumference = ___? ($12\pi \text{ cm}$)
9. **Solid Figure:** Cube with edge 4 cm. Surface area = ___? (96 cm^2)
10. **Graphing:** Find the midpoint between (2,5) and (6,9). ((4,7))

Pre-Test (40 Questions)

Q1. What is a point in geometry?

- A location in space with no size
- A straight path
- A flat surface
- A part of a circle

Q2. What is a line?

- A straight path that extends infinitely in both directions
- A flat surface extending in all directions
- A polygon
- A part of a line with two endpoints

Q3. A line segment is:

- A part of a line with one endpoint
- A part of a line with two endpoints
- A type of angle
- A polygon

Q4. A ray is:

- A circle
- A closed figure
- A triangle
- A part of a line with one endpoint, extending infinitely in one direction

Q5. What tool is used to measure angles?

- Protractor

- Calculator
 - Compass
 - Ruler
-

Q6. An angle measuring less than 90° is:

- Straight angle
 - Obtuse angle
 - Acute angle
 - Right angle
-

Q7. A right angle measures:

- 45°
 - 360°
 - 180°
 - 90°
-

Q8. An angle between 90° and 180° is:

- Obtuse
 - Right
 - Reflex
 - Acute
-

Q9. A triangle with all sides equal is:

- Equilateral
 - Obtuse
 - Scalene
 - Isosceles
-

Q10. A triangle with two equal sides is:

- Isosceles
 - Right
 - Equilateral
 - Scalene
-

Q11. The sum of angles in a triangle is:

- 270°
 - 180°
 - 360°
 - 90°
-

Q12. A quadrilateral with all sides equal and all angles 90° is a:

- Rectangle
 - Rhombus
 - Trapezoid
 - Square
-

Q13. A parallelogram with opposite sides equal and four right angles is a:

- Rectangle
 - Square
 - Rhombus
 - Trapezoid
-

Q14. The sum of angles in a quadrilateral is:

- 540°
 - 270°
 - 360°
 - 180°
-

Q15. A polygon with 5 sides is called a:

- Octagon
 - Quadrilateral
 - Pentagon
 - Hexagon
-

Q16. A regular polygon has:

- All sides and angles equal
- No sides equal
- All sides equal, but angles different

- All angles equal, but sides different
-

Q17. What is the sum of the interior angles of a hexagon?

- 900°
 - 360°
 - 720°
 - 540°
-

Q18. A circle is defined as:

- A set of points equally distant from a center
 - A polygon with infinite sides
 - A closed line segment
 - A line with two endpoints
-

Q19. The distance from the center to the edge of a circle is called:

- Radius
 - Circumference
 - Diameter
 - Chord
-

Q20. The distance around a circle is called:

- Circumference
 - Radius
 - Arc
 - Diameter
-

Q21. The diameter of a circle is:

- π times the radius
 - Twice the radius
 - Equal to the radius
 - Half the radius
-

Q22. The formula for circumference is:

- r^2

- $2\pi r$
 - $\pi d/2$
 - πr^2
-

Q23. A cube has how many faces?

- 12
 - 8
 - 6
 - 4
-

Q24. The surface area of a cube with side a is:

- $2a^2$
 - $6a^2$
 - $4a^2$
 - a^2
-

Q25. A rectangular prism has how many edges?

- 6
 - 8
 - 12
 - 10
-

Q26. Which has circular bases and a curved surface?

- Pyramid
 - Rectangular prism
 - Cylinder
 - Cube
-

Q27. The area of a rectangle is:

- length + width
 - $2 \times (\text{length} + \text{width})$
 - length \div width
 - length \times width
-

Q28. The formula for the surface area of a cylinder is:

- $2\pi r^2$
 - $2r + 2h$
 - $\pi r^2 h$
 - $2\pi r^2 + 2\pi rh$
-

Q29. Which figure has only one vertex?

- Cone
 - Sphere
 - Cube
 - Cylinder
-

Q30. A sphere has how many faces?

- 6 faces
 - 1 curved face
 - 2 faces
 - 12 faces
-

Q31. In the coordinate plane, what are the coordinates of the midpoint of (2, 6) and (6, 10)?

- (2,8)
 - (4,6)
 - (4,8)
 - (8,4)
-

Q32. Distance formula between points (x_1, y_1) and (x_2, y_2) :

- $\sqrt{[(x_2-x_1)^2 + (y_2-y_1)^2]}$
 - $2(x_2-x_1)+(y_2-y_1)$
 - $(x_2+x_1)+(y_2+y_1)$
 - $(x_2-x_1) + (y_2-y_1)$
-

Q33. A triangle with one 90° angle is:

- Right triangle
- Equilateral triangle
- Acute triangle

- Obtuse triangle
-

Q34. A parallelogram has:

- Three sides
 - Opposite sides parallel
 - All sides equal
 - Four right angles
-

Q35. The sum of angles in a pentagon is:

- 900°
 - 540°
 - 360°
 - 720°
-

Q36. A trapezoid has:

- All sides equal
 - At least one pair of parallel sides
 - All angles equal
 - Only right angles
-

Q37. Which of these is a solid figure?

- Square
 - Circle
 - Cube
 - Triangle
-

Q38. What is the area of a triangle with base 6 cm and height 4 cm?

- 10 cm^2
 - 12 cm^2
 - 24 cm^2
 - 20 cm^2
-

Q39. A right angle is:

- 45°

- 120°
 - 90°
 - 180°
-

Q40. The center of a circle is called:

- Center
- Origin
- Circumference
- Diameter

Submit Pre-Test

Questions & Answers (Based on Your Pre-Test)

After completing the Pre-Test, any questions you miss will appear here with explanations.

Post-Test (40 Questions)

Q1. What is a point in geometry?

- A flat surface
 - A location in space with no size
 - A part of a circle
 - A straight path
-

Q2. What is a line?

- A flat surface extending in all directions
 - A part of a line with two endpoints
 - A polygon
 - A straight path that extends infinitely in both directions
-

Q3. A line segment is:

- A type of angle
 - A part of a line with two endpoints
 - A polygon
 - A part of a line with one endpoint
-

Q4. A ray is:

- A triangle
 - A circle
 - A part of a line with one endpoint, extending infinitely in one direction
 - A closed figure
-

Q5. What tool is used to measure angles?

- Ruler
 - Compass
 - Protractor
 - Calculator
-

Q6. An angle measuring less than 90° is:

- Right angle
 - Straight angle
 - Acute angle
 - Obtuse angle
-

Q7. A right angle measures:

- 180°
 - 360°
 - 45°
 - 90°
-

Q8. An angle between 90° and 180° is:

- Right
 - Obtuse
 - Acute
 - Reflex
-

Q9. A triangle with all sides equal is:

- Obtuse
 - Scalene
 - Isosceles
 - Equilateral
-

Q10. A triangle with two equal sides is:

- Scalene
 - Equilateral
 - Right
 - Isosceles
-

Q11. The sum of angles in a triangle is:

- 180°
 - 270°
 - 90°
 - 360°
-

Q12. A quadrilateral with all sides equal and all angles 90° is a:

- Square
 - Trapezoid
 - Rectangle
 - Rhombus
-

Q13. A parallelogram with opposite sides equal and four right angles is a:

- Rhombus
 - Rectangle
 - Trapezoid
 - Square
-

Q14. The sum of angles in a quadrilateral is:

- 360°
- 540°
- 270°

180°

Q15. A polygon with 5 sides is called a:

- Hexagon
 - Octagon
 - Quadrilateral
 - Pentagon
-

Q16. A regular polygon has:

- All sides equal, but angles different
 - All angles equal, but sides different
 - No sides equal
 - All sides and angles equal
-

Q17. What is the sum of the interior angles of a hexagon?

- 360°
 - 540°
 - 900°
 - 720°
-

Q18. A circle is defined as:

- A closed line segment
 - A line with two endpoints
 - A polygon with infinite sides
 - A set of points equally distant from a center
-

Q19. The distance from the center to the edge of a circle is called:

- Chord
 - Diameter
 - Radius
 - Circumference
-

Q20. The distance around a circle is called:

- Circumference

- Radius
 - Diameter
 - Arc
-

Q21. The diameter of a circle is:

- π times the radius
 - Twice the radius
 - Equal to the radius
 - Half the radius
-

Q22. The formula for circumference is:

- $2\pi r$
 - r^2
 - $\pi d/2$
 - πr^2
-

Q23. A cube has how many faces?

- 4
 - 6
 - 8
 - 12
-

Q24. The surface area of a cube with side a is:

- $4a^2$
 - $2a^2$
 - $6a^2$
 - a^2
-

Q25. A rectangular prism has how many edges?

- 8
 - 12
 - 10
 - 6
-

Q26. Which has circular bases and a curved surface?

- Pyramid
 - Cylinder
 - Cube
 - Rectangular prism
-

Q27. The area of a rectangle is:

- length \times width
 - length \div width
 - $2 \times (\text{length} + \text{width})$
 - length + width
-

Q28. The formula for the surface area of a cylinder is:

- $2\pi r^2$
 - $2\pi r^2 + 2\pi rh$
 - $2r + 2h$
 - $\pi r^2 h$
-

Q29. Which figure has only one vertex?

- Cylinder
 - Cone
 - Sphere
 - Cube
-

Q30. A sphere has how many faces?

- 12 faces
 - 2 faces
 - 1 curved face
 - 6 faces
-

Q31. In the coordinate plane, what are the coordinates of the midpoint of (2, 6) and (6, 10)?

- (8,4)
- (4,8)
- (2,8)

- (4,6)
-

Q32. Distance formula between points (x_1, y_1) and (x_2, y_2) :

- $2(x_2-x_1)+(y_2-y_1)$
 $(x_2+x_1)+(y_2+y_1)$
 $\sqrt{[(x_2-x_1)^2 + (y_2-y_1)^2]}$
 $(x_2-x_1) + (y_2-y_1)$
-

Q33. A triangle with one 90° angle is:

- Equilateral triangle
 Obtuse triangle
 Right triangle
 Acute triangle
-

Q34. A parallelogram has:

- Opposite sides parallel
 Four right angles
 All sides equal
 Three sides
-

Q35. The sum of angles in a pentagon is:

- 360°
 540°
 720°
 900°
-

Q36. A trapezoid has:

- At least one pair of parallel sides
 All angles equal
 All sides equal
 Only right angles
-

Q37. Which of these is a solid figure?

- Cube

- Square
 - Triangle
 - Circle
-

Q38. What is the area of a triangle with base 6 cm and height 4 cm?

- 12 cm²
 - 10 cm²
 - 20 cm²
 - 24 cm²
-

Q39. A right angle is:

- 45°
 - 180°
 - 120°
 - 90°
-

Q40. The center of a circle is called:

- Origin
- Center
- Circumference
- Diameter

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