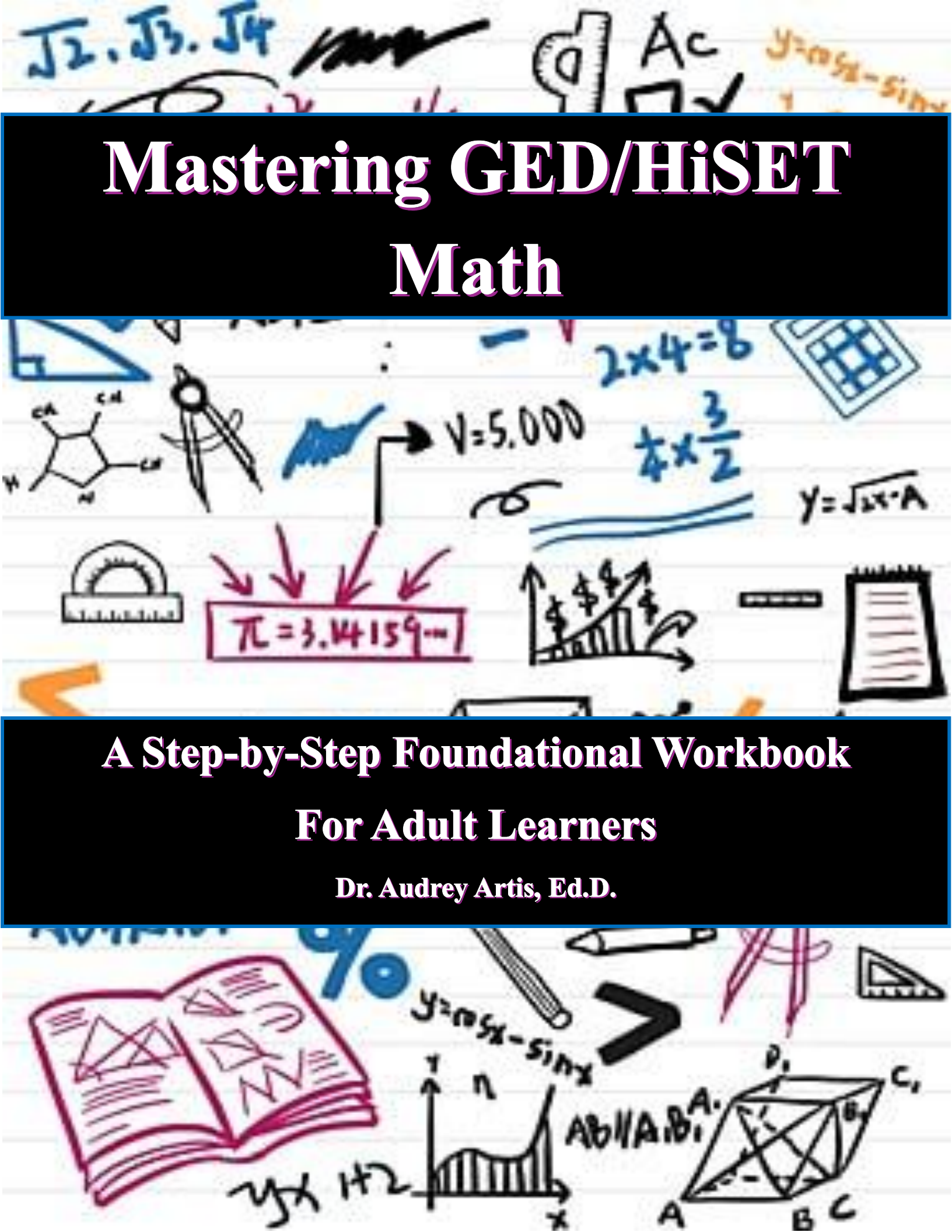




Mastering GED/HiSET Math

A Step-by-Step Foundational Workbook For Adult Learners

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Beginner Level

Chapter 1: Understanding Numbers

Concept Explanation

Numbers are the foundation of math. Understanding whole numbers, integers, place value, and basic operations is essential for solving everyday problems.

Example: You buy **20 apples** at the grocery store but eat **5** throughout the week. To determine how many you have left, use subtraction: **$20 - 5 = 15$ apples remaining.**

Key Number Concepts

1. Whole Numbers vs. Integers:

- Whole numbers: **0, 1, 2, 3, ...**
- Integers: **... -3, -2, -1, 0, 1, 2, 3, ...**

2. Place Value:

- The number **3,248** has:
 - **3** in the thousands place
 - **2** in the hundreds place
 - **4** in the tens place
 - **8** in the ones place

3. Basic Operations:

- Addition: **$8 + 4 = 12$**
- Subtraction: **$15 - 7 = 8$**
- Multiplication: **$6 \times 3 = 18$**
- Division: **$20 \div 5 = 4$**

Practice Exercises

Solve the following problems:

Addition:

1. $65 + 28 =$ _____
2. $149 + 376 =$ _____

3. $8,530 + 1,247 =$ _____

Subtraction:

4. $93 - 47 =$ _____

5. $500 - 275 =$ _____

6. $10,000 - 4,682 =$ _____

Multiplication:

7. $7 \times 8 =$ _____

8. $23 \times 15 =$ _____

9. $120 \times 35 =$ _____

Division:

10. $64 \div 8 =$ _____

11. $144 \div 12 =$ _____

12. $1,000 \div 25 =$ _____

Real-World Application

Numbers are used daily for budgeting, measuring, and problem-solving. If you have **\$500** and spend **\$175**, subtracting helps track remaining money: **$\$500 - \$175 = \$325$**

GED/HiSET-Style Quiz

Multiple-Choice Questions:

1. What is **7×9** ? a) 54 b) 63 c) 72 d) 79
2. What is the sum of **$124 + 276$** ? a) 300 b) 390 c) 400 d) 410
3. If you subtract **200** from **850**, what is the result? a) 550 b) 600 c) 650 d) 700
4. What is **$225 \div 5$** ? a) 45 b) 50 c) 55 d) 60

5. Which number is an integer but **not** a whole number? a) 6 b) 0 c) -3 d) 10

Answer Key:

1. b) 63
2. b) 390
3. c) 650
4. a) 45
5. c) -3

Chapter 2: Understanding Fractions and Decimals

Concept Explanation Fractions and decimals represent parts of a whole. Understanding how to convert between them is essential for solving real-world problems, such as budgeting, cooking, and measurements.

Example: Fraction: $\frac{1}{2}$ Decimal: 0.5

Conversion Rules

- Fraction to Decimal:** Divide the numerator (top number) by the denominator (bottom number).
 - $\frac{3}{4} \rightarrow 3 \div 4 = 0.75$. To convert $\frac{3}{4}$ into a decimal, divide the numerator by the denominator. Dividing 3 by 4 results in 0.75.
- Decimal to Fraction:** Write the decimal over a power of 10 and simplify.
 - $0.75 \rightarrow \frac{75}{100} \rightarrow \frac{3}{4}$. Convert **0.75** to a fraction: $>$ - Write it as **$\frac{75}{100}$** $>$ - Divide **both numerator and denominator** by 25 $>$ - Simplified fraction: **$\frac{3}{4}$**

Practice Exercises

Convert the following fractions to decimals:

- $\frac{1}{4} = \underline{\hspace{2cm}}$
- $\frac{2}{5} = \underline{\hspace{2cm}}$
- $\frac{7}{8} = \underline{\hspace{2cm}}$
- $\frac{5}{6} = \underline{\hspace{2cm}}$
- $\frac{9}{10} = \underline{\hspace{2cm}}$

Convert the following decimals to fractions:

6. $0.2 =$ _____

7. $0.6 =$ _____

8. $0.125 =$ _____

9. $0.375 =$ _____

10. $0.8 =$ _____

Simplify the following fractions:

11. $12/16 =$ _____

12. $45/60 =$ _____

13. $100/125 =$ _____

14. $18/24 =$ _____

15. $50/75 =$ _____

Real-World Application You need $3/5$ of a cup of sugar for a recipe, but your measuring cup uses decimals instead. Converting $3/5$ to 0.6 helps you measure accurately and ensures your recipe turns out just right.

GED/HiSET-Style Quiz

Multiple-Choice Questions:

1. What is $1/4$ as a decimal? a) 0.25 b) 0.4 c) 0.5 d) 0.75
2. What is 0.6 as a fraction in simplest form? a) $3/5$ b) $6/10$ c) $2/3$ d) $1/2$
3. Which of the following fractions is equivalent to 0.75 ? a) $3/4$ b) $1/2$ c) $2/3$ d) $4/5$
4. What is $7/8$ as a decimal? a) 0.875 b) 0.7 c) 0.8 d) 0.78

5. What is 0.125 as a fraction in simplest form? a) $\frac{1}{8}$ b) $\frac{1}{4}$ c) $\frac{1}{2}$ d) $\frac{3}{8}$

Answer Key:

1. a) 0.25

2. a) $\frac{3}{5}$

3. a) $\frac{3}{4}$

4. a) 0.875

5. a) $\frac{1}{8}$

Chapter 3: Basic Algebra

Concept Explanation

Algebra is a fundamental skill for solving problems using variables, equations, and expressions. Understanding how to manipulate symbols and numbers will help in daily problem-solving and GED/HiSET math success.

Example: If $x + 3 = 10$, solve for x : Subtract 3 from both sides: $x = 7$

Key Algebra Rules

1. **Solving for x :** Isolate the variable using inverse operations.
 - Example: $x - 5 = 12 \rightarrow$ Add 5 to both sides $\rightarrow x = 17$
2. **Combining Like Terms:**
 - Example: $3x + 2x - 4 \rightarrow 5x - 4$
3. **Distributive Property:**
 - Example: $2(x + 4) = 2x + 8$
4. **Working with Exponents:**
 - Example: x^2 means x multiplied by itself: $x^2 = x \times x$

Practice Exercises

Solve for x in the following equations:

1. $x + 4 = 15$
2. $5x = 25$
3. $x - 9 = 20$
4. $3x + 6 = 18$
5. $x/3 = 7$

Simplify the following expressions:

6. $4x + 3x - 2$
7. $5(x - 3) + 2x$
8. $6x^2 + 3x^2 - x$

9. $(x + 5)(x - 2)$
10. $2(x + 6) - 3(x - 1)$

Real-World Application

Algebra is used for budgeting, calculating travel time, and solving equations in construction. Example: If a taxi charges **\$5 plus \$2 per mile**, the equation **total cost = $5 + 2x$** helps determine the price for **x miles**.

GED/HiSET-Style Quiz

Multiple-Choice Questions:

1. Solve for **x**: **$x + 8 = 20$** a) 8 b) 12 c) 20 d) 28
2. Simplify: **$5x + 2x - 3$** a) **$7x - 3$** b) **$5x + 3$** c) **$2x - 3$** d) **$7x + 3$**
3. Apply the distributive property: **$3(x + 4)$** a) **$3x + 4$** b) **$3x + 12$** c) **$12x + 4$** d) **$12x + 12$**
4. Solve for **x**: **$4x = 16$** a) 2 b) 4 c) 8 d) 16
5. What does **x^2** represent? a) **$x + x$** b) **x multiplied by itself** c) **x divided by 2** d) **x minus 2**

Answer Key:

1. b) 12
2. a) $7x - 3$
3. b) $3x + 12$
4. b) 4
5. b) x multiplied by itself

Chapter 4: Word Problems and Applications

Concept Explanation

Word problems help apply math to real-life situations, such as shopping, budgeting, and travel. Understanding how to translate words into equations will improve problem-solving skills.

Example: If a store sells apples for **\$2 each** and you buy **4 apples**, the total cost is: $2 \times 4 = 8$ dollars

Steps to Solving Word Problems

1. **Identify key information**
 - Look for numbers, variables, and relationships in the problem.
2. **Set up the equation**
 - Convert the problem into a mathematical expression.
3. **Solve and check your answer**
 - Perform operations carefully and verify that the solution makes sense.

Practice Exercises

Solve the following word problems:

1. A book costs **\$12**. If you buy **5 books**, what is the total cost?
2. A train travels **60 miles per hour**. How far does it travel in **3 hours**?
3. A bakery has **320 cupcakes** and sells **75** each hour. How many are left after **4 hours**?
4. Sarah earns **\$9 per hour** at her job. If she works **8 hours per day** for **5 days**, how much does she earn in total?
5. A rectangle has a length of **12 cm** and a width of **5 cm**. Find the area.

Real-World Application

Math is everywhere—from budgeting groceries to planning road trips. Example: If gas costs **\$4 per gallon** and your car needs **15 gallons**, multiplying: $4 \times 15 = 60$ **dollars** helps estimate the total cost.

GED/HiSET-Style Quiz

Multiple-Choice Questions:

1. A store sells bananas for **\$0.50 each**. If you buy **6 bananas**, how much do you pay? a) \$2.50 b) \$3.00 c) \$3.50 d) \$4.00
2. A car travels **45 miles per hour** for **2.5 hours**. How far does it go? a) 110 miles b) 112.5 miles c) 120 miles d) 135 miles
3. A box holds **240 pencils**. If **15 students** share them equally, how many pencils does each student get? a) 12 b) 16 c) 18 d) 20
4. A family spends **\$75 per week** on groceries. How much do they spend in **4 weeks**? a) \$250 b) \$275 c) \$300 d) \$350
5. A rectangle's area is **48 square inches**, and its width is **8 inches**. What is its length? a) 6 inches b) 8 inches c) 10 inches d) 12 inches

Answer Key:

1. b) \$3.00
2. b) 112.5 miles
3. c) 16
4. c) \$300
5. a) 6 inches

Intermediate Level

Chapter 5: Geometry Essentials

Concept Explanation

Geometry focuses on shapes, sizes, angles, and spatial relationships. Understanding geometric principles helps with measurements, construction, and problem-solving.

Example: If a rectangle's length is **10 cm** and its width is **4 cm**, its area is: **Area = length × width** **Area = $10 \times 4 = 40 \text{ cm}^2$**

Key Geometry Concepts

1. Types of Angles:

- **Acute Angle:** Less than 90°
- **Right Angle:** Exactly 90°
- **Obtuse Angle:** Greater than 90° but less than 180°
- **Straight Angle:** Exactly 180°

2. Triangle Properties:

- **Equilateral Triangle:** All sides are equal
- **Isosceles Triangle:** Two sides are equal
- **Scalene Triangle:** No sides are equal

3. Area and Perimeter Formulas:

- Rectangle: **Area = length × width**
- Triangle: **Area = $\frac{1}{2} \times \text{base} \times \text{height}$**
- Circle: **Area = $\pi \times \text{radius}^2$**
- Perimeter: Add the lengths of all sides

4. Volume Formulas:

- Cube: **Volume = side^3**
- Rectangular prism: **Volume = length × width × height**
- Cylinder: **Volume = $\pi \times \text{radius}^2 \times \text{height}$**

Practice Exercises

Find the missing values:

1. A square has sides of **6 cm**. Find its **area** and **perimeter**.

2. A triangle has a base of **8 cm** and a height of **5 cm**. Find its **area**.
3. A circle has a radius of **3 cm**. Find its **area** using $\pi \approx 3.14$.
4. A rectangular prism has dimensions of **4 cm** $\times$ **5 cm** $\times$ **6 cm**. Find its **volume**.
5. A cube has a side length of **3 cm**. Find its **volume**.

Real-World Application

Geometry is used in construction, design, and navigation. Example: If a room is **12 feet wide** and **15 feet long**, calculating **Area** = $12 \times 15 = 180$ **ft²** helps determine how much flooring is needed.

GED/HiSET-Style Quiz

Multiple-Choice Questions:

1. What is the area of a rectangle with **length 9 cm** and **width 7 cm**?
a) 56 cm² b) 63 cm² c) 72 cm² d) 81 cm²
2. A triangle has a base of **6 cm** and a height of **4 cm**. What is its area? a) 12 cm² b) 18 cm² c) 24 cm² d) 30 cm²
3. A circle has a radius of **5 cm**. Using $\pi \approx 3.14$, find its area. a) 15.7 cm² b) 25.0 cm² c) 78.5 cm² d) 100.0 cm²
4. What is the volume of a cube with a side length of **4 cm**? a) 16 cm³ b) 32 cm³ c) 64 cm³ d) 128 cm³
5. A rectangle has a perimeter of **20 cm**. If its length is **6 cm**, what is its width? a) 4 cm b) 5 cm c) 6 cm d) 7 cm

Answer Key:

1. b) 63 cm^2
2. a) 12 cm^2
3. c) 78.5 cm^2
4. c) 64 cm^3
5. a) 4 cm

Chapter 6: Linear Equations and Inequalities

Concept Explanation

Linear equations represent relationships between variables in a straight-line pattern. Inequalities express comparisons, showing when values are greater than, less than, or equal to each other.

Example: Equation: $2x + 5 = 15$ Solve for x :

1. Subtract **5** from both sides $\rightarrow 2x = 10$
2. Divide by **2** $\rightarrow x = 5$

Inequality: $x + 3 > 10$ Solve for x :

1. Subtract **3** $\rightarrow x > 7$ This means **x must be greater than 7.**

Key Rules for Linear Equations

1. **Solving for x :** Isolate the variable using inverse operations.
2. **Graphing a Linear Equation:** Find $y = mx + b$, where **m** is the slope and **b** is the y-intercept.
3. **Checking Solutions:** Substitute the value of x into the equation to verify its correctness.

Key Rules for Inequalities

1. **Solving Inequalities:** Treat them like equations, but **flip the inequality sign** when multiplying/dividing by a negative number.
2. **Graphing Inequalities:** Use a **solid line** for $\geq$ or $\leq$ and a **dashed line** for $>$ or $<$.
3. **Checking Solutions:** Plug values into the inequality to confirm they satisfy the condition.

Practice Exercises

Solve for x in the following equations:

1. $3x + 4 = 19$
2. $5x - 8 = 17$
3. $2(x - 3) = 14$
4. $x/4 + 7 = 12$
5. $4(x + 2) = 28$

Solve the following inequalities:

6. $x - 5 \geq 10$
7. $2x + 3 < 17$
8. $4x - 6 > 10$
9. $x/3 \leq 9$
10. $5x + 8 \geq 28$

Real-World Application

Linear equations and inequalities appear in budgeting, calculating profits, and measuring distances. Example: If a business earns **\$150 per week**, the equation **$150x = \text{total earnings}$** helps track profits over **x weeks**.

GED/HiSET-Style Quiz

Multiple-Choice Questions:

1. Solve for x : **$4x + 7 = 23$** a) 3 b) 4 c) 5 d) 6
2. Solve for x : **$6x - 9 = 15$** a) 2 b) 3 c) 4 d) 5
3. Solve the inequality **$x + 4 \leq 12$** a) $x \leq 6$ b) $x \geq 6$ c) $x \leq 8$ d) $x \geq 8$
4. Which inequality correctly represents **$5x > 25$** ? a) $x > 3$ b) $x < 3$ c) $x > 5$ d) $x > 7$
5. Which equation is in slope-intercept form? a) **$y = 3x + 2$** b) **$3x - 5 = y$** c) **$2(y - 1) = 6x$** d) **$x^2 + 3 = 10$**

Answer Key:

1. c) 5
2. b) 4
3. a) $x \leq 8$
4. c) $x > 5$
5. a) $y = 3x + 2$

Chapter 7: Data Interpretation

Concept Explanation

Data interpretation involves analyzing tables, graphs, charts, and statistics to make sense of information. It helps in real-world scenarios like budgeting, tracking trends, and understanding survey results.

Example: If a graph shows that a company's sales increased from **\$5,000 in January** to **\$7,500 in February**, you can calculate the increase: $\$7,500 - \$5,000 = \$2,500$ increase

Types of Data Representations

1. **Bar Graphs:** Compare different groups using rectangular bars.
2. **Line Graphs:** Show trends over time with points connected by lines.
3. **Pie Charts:** Represent percentages as slices of a circle.
4. **Tables:** Organize numerical data for easy comparison.

Key Statistical Terms:

- **Mean (Average):** Sum of values $\div$ number of values
- **Median:** Middle value in an ordered list
- **Mode:** Most frequently occurring value

Practice Exercises

Use the following data table to answer the questions:

Month	Sales (\$)
January	5,000
February	7,500
March	6,000
April	8,000
May	7,200

1. What was the total sales amount for **January to May**?
2. What was the **average (mean)** sales amount?
3. Which month had the **highest sales**?
4. Which month had the **lowest sales**?
5. If sales increase by **10%** in June, what will be the new sales amount?

Real-World Application

Data interpretation is useful for tracking trends in business, sports, and science. Example: If a student tracks their test scores—**75, 80, 85, 90**—finding the **mean** = $(75 + 80 + 85 + 90) \div 4 = 82.5$ helps assess overall performance.

GED/HiSET-Style Quiz

Multiple-Choice Questions:

1. If a pie chart shows that **40%** of students prefer math, how many students out of **500** prefer math? a) 150 b) 200 c) 250 d) 300
2. If the mode of the data set **15, 18, 22, 18, 24, 18, 30** is asked, what is the answer? a) 15 b) 18 c) 22 d) 24
3. The median of the numbers **10, 20, 30, 40, 50** is: a) 20 b) 30 c) 40 d) 50
4. A bar graph shows that **Restaurant A** made **\$10,000**, **Restaurant B** made **\$8,500**, and **Restaurant C** made **\$9,200**. Which restaurant made the highest earnings? a) Restaurant A b) Restaurant B c) Restaurant C d) They all made the same amount
5. What is the mean of the numbers **5, 10, 15, 20, 25**? a) 10 b) 15 c) 20 d) 25

Answer Key:

1. c) 200
2. b) 18
3. b) 30
4. a) Restaurant A
5. b) 15

Chapter 8: Applied Math Problems

Concept Explanation

Applied math is about solving problems that directly relate to real-world situations. Understanding how to set up and solve equations is key to making everyday calculations, such as budgeting, measurements, and comparisons.

Example: If a grocery store charges **\$2 per pound** for apples and you buy **5 pounds**, your total cost is: $\$2 \times 5 = \10

Key Applied Math Topics

1. Ratios and Proportions:

- **Example:** If a recipe calls for **2 cups of flour** per **3 cups of sugar**, how much flour is needed for **9 cups of sugar**?

2. Percentages and Discounts:

- **Example:** A jacket originally costs **\$50**, but it is on sale for **20% off**.
- **Calculation:** $20\% \text{ of } \$50 = \10 , so the final price is **\$40**.

3. Unit Conversions:

- **Example:** If a car travels **60 miles per hour**, how many miles will it cover in **3 hours**?
- **Calculation:** $60 \times 3 = 180$ miles

4. Cost Analysis:

- **Example:** A phone plan costs **\$30 per month**. How much will it cost for a **full year**?
- **Calculation:** $\$30 \times 12 = \360

Practice Exercises

Solve the following problems:

1. A bicycle costs **\$250**. If there is a **15% discount**, what is the sale price?

2. A factory produces **500 boxes per day**. How many boxes will be produced in **8 days**?
3. A recipe uses **4 cups of flour** for **6 servings**. How many cups of flour are needed for **12 servings**?
4. A runner completes **5 miles per hour**. How many miles will they run in **2.5 hours**?
5. If a car gets **30 miles per gallon**, how many gallons of gas are needed to travel **450 miles**?

Real-World Application

Applied math helps make everyday calculations easier, from shopping discounts to calculating travel time. Example: If you need **\$200 per week** for expenses, multiply $\$200 \times 4$ to find that you need **\$800 per month** to cover costs.

GED/HiSET-Style Quiz

Multiple-Choice Questions:

1. A meal originally costs **\$18**, but there is a **10% tip** added. What is the total price? a) \$18 b) \$19.80 c) \$20.50 d) \$22.00
2. A store sells pencils in packs of **12**. If a class of **30 students** each need **2 pencils**, how many packs should be purchased? a) 3 packs b) 5 packs c) 6 packs d) 7 packs
3. A car travels **55 miles per hour** for **4 hours**. How far does it travel? a) 200 miles b) 220 miles c) 240 miles d) 250 miles
4. A customer buys a jacket for **\$40** and pays **6% sales tax**. What is the total amount paid? a) \$42.40 b) \$44.00 c) \$45.20 d) \$46.80
5. A company produces **500 items per day** for **7 days**. How many items are produced in a week? a) 2,500 b) 3,000 c) 3,500 d) 4,000

Answer Key:

1. b) \$19.80
2. c) 6 packs
3. b) 220 miles
4. a) \$42.40
5. c) 3,500

Advanced Level

Chapter 9: Quadratics and Exponents

Concept Explanation

Quadratic equations and exponents help solve complex mathematical problems, from physics equations to business growth analysis. A quadratic equation includes an x^2 term, while exponents show repeated multiplication.

Example: Quadratic Equation: $x^2 + 5x + 6 = 0$ Factor: $(x + 2)(x + 3) = 0$ Solve for x : $x = -2$ or $x = -3$

Exponent Rule: 3^3 means $3 \times 3 \times 3 = 27$

Key Rules for Quadratics

- Factoring Quadratic Equations:**
 - Example: $x^2 + 6x + 9 = 0 \rightarrow (x + 3)(x + 3) = 0 \rightarrow x = -3$
- Using the Quadratic Formula:**
 - Formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
- Graphing Quadratic Functions:**
 - Example: $y = x^2 - 4 \rightarrow$ Creates a U-shaped parabola

Key Rules for Exponents

- Multiplying Exponents:**
 - Example: $x^3 \times x^2 = x^5$
- Dividing Exponents:**
 - Example: $x^5 \div x^2 = x^3$
- Exponent Power Rule:**
 - Example: $(x^2)^3 = x^6$

Practice Exercises

Solve the following quadratic equations:

1. $x^2 + 7x + 10 = 0$

2. $x^2 - 4x - 12 = 0$
3. $x^2 + 9x + 20 = 0$
4. $x^2 - 6x + 8 = 0$
5. $x^2 + 5x - 24 = 0$

Simplify the following exponent expressions:

6. $x^3 \times x^4$
7. $y^6 \div y^2$
8. $(a^2)^3$
9. $b^4 \times b^2 \div b^3$
10. $(x^5)^2$

Real-World Application

Quadratic equations help calculate projectile motion in physics, while exponents are used in finance to determine compound interest. Example: If an investment grows at **5% per year**, its future value follows the exponent formula $A = P(1.05)^n$, where **n** is the number of years.

GED/HiSET-Style Quiz

Multiple-Choice Questions:

1. Solve for **x**: $x^2 - 6x + 9 = 0$ a) -3 b) 3 c) -6 d) 6
2. Which expression equals $x^4 \times x^2$? a) x^6 b) x^7 c) x^8 d) x^2
3. If $(x^3)^2$ is simplified, what is the result? a) x^6 b) x^5 c) x^4 d) x^3
4. Solve using the quadratic formula: $x^2 - 4x - 5 = 0$ a) $x = 5$ or $x = -1$
b) $x = 4$ or $x = -1$ c) $x = 3$ or $x = -2$ d) $x = 6$ or $x = -2$
5. What does x^0 always equal? a) 0 b) 1 c) x d) $x + 1$

Answer Key:

1. b) 3
2. a) x^6
3. a) x^6
4. a) $x = 5$ or $x = -1$
5. b) 1

Chapter 10: Probability and Statistics

Concept Explanation

Probability and statistics help analyze outcomes, patterns, and data. Probability measures the likelihood of an event occurring, while statistics organize and interpret numbers to find trends.

Example: If a bag contains **4 red, 3 blue, and 3 green** marbles, the probability of picking a red marble is: $P(\text{red}) = 4 / (4 + 3 + 3) = 4/10 = 0.4 = 40\%$

Key Probability Rules

1. Probability Formula:

- Probability = **(desired outcomes) / (total outcomes)**
- Example: Rolling a **4** on a six-sided die → **1/6 probability**

2. Independent vs. Dependent Events:

- **Independent:** The result of one event does not affect another (e.g., flipping a coin).
- **Dependent:** The result of one event changes the probability of another (e.g., drawing cards without replacement).

3. Complementary Probability:

- Probability of an event **not** happening = **1 - probability of event happening**
- Example: If $P(\text{win}) = 0.75$, then $P(\text{not win}) = 1 - 0.75 = 0.25$

Key Statistical Concepts

1. Mean (Average):

- Formula: **Mean = (sum of values) / (number of values)**
- Example: The average of **10, 20, 30** is $(10 + 20 + 30) / 3 = 20$

2. Median:

- Middle number in an ordered set of values.
- Example: **5, 12, 18, 22, 30** → Median = **18**

3. Mode:

- The most frequently occurring value.
 - Example: **3, 7, 7, 8, 9, 7, 10** → Mode = 7
4. **Range:**
- Difference between the largest and smallest values.
 - Example: **4, 9, 15, 22, 30** → Range = **30 - 4 = 26**

Practice Exercises

Solve the following probability problems:

1. A bag has **3 yellow, 5 blue, and 2 green** marbles. What is the probability of picking a **blue** marble?
2. A spinner has **4 equal sections**: A, B, C, and D. What is the probability of landing on **C**?
3. A deck contains **8 red, 12 blue, and 10 green** cards. What is the probability of picking a **red** card?
4. A six-sided die is rolled. What is the probability of getting an **even number**?
5. A box has **10 pens**, and **4** are broken. What is the probability of choosing a **working pen**?

Solve the following statistics problems:

6. Find the **mean** of: **7, 12, 15, 20, 30**
7. Find the **median** of: **18, 25, 29, 40, 50, 55**
8. Find the **mode** of: **12, 17, 22, 12, 19, 12, 24**
9. Find the **range** of: **4, 9, 12, 20, 32, 45**
10. Find the **mean** of: **4, 8, 16, 24, 32**

Real-World Application

Probability predicts outcomes in gambling, sports, and business risk analysis. Statistics help analyze trends in sales, test scores, and medical research. Example: If 65% of survey respondents prefer **product A**, a company knows **A is more popular than competitors**.

GED/HiSET-Style Quiz

Multiple-Choice Questions:

1. A deck has **5 red, 7 blue, and 8 yellow** cards. What is the probability of picking a yellow card? a) $5/20$ b) $7/20$ c) $8/20$ d) $10/20$
2. What is the **mean** of **6, 12, 18, 24**? a) 12 b) 15 c) 18 d) 20
3. The median of **3, 9, 15, 21, 27, 33** is: a) 9 b) 15 c) 18 d) 21
4. A coin is flipped. What is the probability of getting heads? a) $1/2$ b) $1/3$ c) $1/4$ d) $1/6$
5. The mode of **7, 14, 14, 21, 28, 14, 35** is: a) 7 b) 14 c) 21 d) 28

Answer Key:

1. c) $\frac{8}{20}$
2. c) 18
3. d) 21
4. a) $\frac{1}{2}$
5. b) 14

Chapter 11: Multi-Step Problem Solving

Concept Explanation

Multi-step math problems require more than one operation—addition, subtraction, multiplication, division, or a combination—to reach the final answer. They often appear in word problems or complex equations.

Example: A store has **200 apples**. Each customer buys **5 apples**, and **30 customers** make purchases. Step 1: Multiply $30 \times 5 = 150$ apples bought Step 2: Subtract $200 - 150 = 50$ apples left

Key Strategies for Multi-Step Problems

1. **Read Carefully:** Identify all numbers, operations, and question requirements.
2. **Break It Down:** Solve one step at a time instead of rushing to the final answer.
3. **Use Equations:** Convert word problems into algebraic expressions.
4. **Check Your Work:** Always double-check calculations to ensure accuracy.

Practice Exercises

Solve the following problems:

1. A school orders **360 books**. If each classroom gets **45 books**, how many classrooms receive books?
2. A runner completes **5 miles per hour**. How many miles will they run in **3.5 hours**?
3. A store has **250 shirts** in stock. If they sell **30 shirts per day**, how many days until only **40 shirts** are left?
4. A rectangle has a **length of 12 cm** and a **width of 8 cm**. Find its **area** and **perimeter**.

5. A restaurant makes **240 pizzas** each week. If half are **cheese** and the rest are **pepperoni**, how many pepperoni pizzas are made in **4 weeks**?

Real-World Application

Multi-step problem solving is used in budgeting, business calculations, and scheduling. Example: If a monthly rent is **\$1,200**, and a tenant saves **\$300 per week**, they need to save for $1,200 \div 300 = 4$ **weeks** to afford rent.

GED/HiSET-Style Quiz

Multiple-Choice Questions:

1. A store sells **80 boxes of cereal per week**. How many will be sold in **6 weeks**? a) 400 b) 420 c) 480 d) 500
2. A bakery makes **600 cupcakes per week**. Half are sold on **Monday and Tuesday**, and the rest are sold evenly over **Wednesday to Friday**. How many cupcakes are sold per day from **Wednesday to Friday**? a) 100 b) 120 c) 150 d) 180
3. A warehouse stores **5,000 pounds of sugar**. A truck carries **250 pounds** per trip. How many trips does the truck need to make? a) 15 b) 18 c) 20 d) 25
4. A soccer team plays **2 games per week**. After **10 weeks**, how many games have they played? a) 18 b) 20 c) 22 d) 24
5. A restaurant buys **400 pounds of flour** per month. If each pizza uses **2 pounds** of flour, how many pizzas can be made in a month? a) 150 b) 175 c) 200 d) 250

Answer Key:

1. c) 480
2. c) 150
3. c) 20
4. b) 20
5. d) 250

Chapter 12: GED/HiSET Test Strategies

Concept Explanation

Understanding the format and strategies for the GED/HiSET math test helps increase efficiency and accuracy. Time management, problem-solving techniques, and avoiding common mistakes are key to success.

Key GED/HiSET Test Strategies

1. Know the Test Format:

- Multiple-choice questions
- Fill-in-the-blank problems
- Drag-and-drop and graphing questions (GED)

2. Time Management Techniques:

- Prioritize **easy questions first**
- Allocate time wisely: **Don't spend too long on one problem**
- Use **estimation** for quick answers

3. Understanding Common Mistakes:

- Misreading problems
- Forgetting order of operations (**PEMDAS**)
- Skipping units in measurement conversions

4. Problem-Solving Techniques:

- Use **elimination** for multiple-choice questions
- Substitute answers into equations
- Break word problems into steps

Practice Exercises

Solve the following GED/HiSET-style questions:

1. If $x = 5$, what is the value of $2x^2 - 3x + 7$?
2. A store discounts items by **30%**. If a shirt costs **\$25**, what is the final price?
3. Solve for y in the equation: $3y + 6 = 24$

4. A rectangle has a length of **14 cm** and a width of **9 cm**. Find its **area**.
5. A graph shows that a company's profits increased from **\$4,000 to \$6,500** in one year. What is the total increase in profit?

Real-World Application

GED/HiSET math strategies apply to budgeting, problem-solving, and data analysis in professional fields. Example: If a business spends **\$500 per month**, estimating $500 \times 12 = \$6,000$ **per year** simplifies planning finances.

GED/HiSET-Style Quiz

Multiple-Choice Questions:

1. What is **30% of \$90**? a) \$20 b) \$25 c) \$27 d) \$30
2. Solve for **x**: $5x - 15 = 35$ a) 7 b) 8 c) 9 d) 10
3. Which step is first in solving $(8 + 3) \times 2^2$? a) Addition b) Multiplication c) Exponents d) Division
4. If a store sells **18 apples per day**, how many apples are sold in **2 weeks**? a) 216 b) 252 c) 270 d) 288
5. The average of **45, 60, and 75** is: a) 55 b) 60 c) 65 d) 70

Answer Key:

1. c) \$27
2. c) 10
3. c) Exponents
4. a) 216
5. b) 60

Chapter 13: Final Review & Practice Tests

Final Review of Key Concepts

This chapter provides a comprehensive review of all major math topics covered in the workbook. Before attempting the practice tests, make sure you understand the following:

1. **Understanding Numbers** – Whole numbers, integers, place value, and operations
2. **Fractions and Decimals** – Converting, comparing, and solving problems
3. **Basic Algebra** – Solving for variables and combining like terms
4. **Word Problems** – Translating words into equations and step-by-step problem-solving
5. **Geometry Essentials** – Angles, area, perimeter, and volume calculations
6. **Linear Equations and Inequalities** – Solving algebraic equations and inequalities
7. **Data Interpretation** – Understanding graphs, charts, and statistics
8. **Applied Math Problems** – Real-world math applications like percentages and unit conversions
9. **Quadratics and Exponents** – Factoring, exponent rules, and quadratic equations
10. **Probability and Statistics** – Finding probabilities, mean, median, and mode
11. **Multi-Step Problem Solving** – Tackling complex problems with multiple operations
12. **GED/HiSET Test Strategies** – Time management, avoiding common mistakes, and test-day tips

Now, test your knowledge with two **full-length practice tests** designed to simulate real GED/HiSET math exam questions.

Practice Test 1: Mixed Math Problems

Solve the following problems:

1. What is **15% of 80**?
2. Solve for **x**: **$4x - 7 = 29$**
3. A triangle has a base of **10 cm** and a height of **6 cm**. Find its **area**.
4. A graph shows a company's profits increased from **\$5,000 to \$8,000** in one year. What was the increase?
5. A restaurant sells **120 meals per day**. How many meals are sold in **3 weeks**?
6. A bag contains **5 red, 3 blue, and 2 green marbles**. What is the probability of picking a blue marble?
7. Simplify: **$3^2 + 4 \times 5$** .
8. A rectangle has a length of **15 cm** and a width of **10 cm**. Find its perimeter.
9. If a car travels **60 miles per hour**, how far will it travel in **2.5 hours**?
10. A store discounts an item by **20%**, and the original price is **\$50**. What is the discounted price?
11. Solve for **y**: **$2y + 5 = 17$** .
12. A circle has a radius of **7 cm**. Find its area using **$\pi \approx 3.14$** .
13. A student scores **85, 90, 78, and 92** on four tests. What is their average score?
14. A train travels **90 miles in 1.5 hours**. What is its speed in miles per hour?
15. A bag contains **6 apples, 4 oranges, and 10 bananas**. What fraction of the bag's contents are bananas?

Practice Test 2: GED/HiSET-Style Questions

Multiple-Choice Questions:

1. A store offers **25% off** a jacket originally priced at **\$80**. What is the final price? a) \$50 b) \$55 c) \$60 d) \$65
2. Solve for **x**: **$5(x - 4) = 25$** a) 3 b) 4 c) 5 d) 6

3. A rectangle has a length of **18 cm** and a width of **12 cm**. Find its area. a) 160 cm^2 b) 180 cm^2 c) 210 cm^2 d) 216 cm^2
4. A company's profit increased **\$2,500 per year** over **4 years**. What is the total increase? a) \$8,500 b) \$9,000 c) \$10,000 d) \$12,000
5. The average of **72, 86, 94, 78** is: a) 82 b) 83 c) 84 d) 85
6. A six-sided die is rolled. What is the probability of rolling an even number? a) $\frac{1}{6}$ b) $\frac{1}{3}$ c) $\frac{1}{2}$ d) $\frac{2}{3}$
7. Simplify: **$(8 + 2) \times 3 - 4$** . a) 24 b) 26 c) 28 d) 30
8. A train travels **90 miles in 1.5 hours**. What is its speed in miles per hour? a) 45 mph b) 50 mph c) 55 mph d) 60 mph
9. A bag contains **6 apples, 4 oranges, and 10 bananas**. What fraction of the bag's contents are bananas? a) $\frac{1}{2}$ b) $\frac{1}{3}$ c) $\frac{1}{4}$ d) $\frac{1}{5}$
10. A student scores **85, 90, 78, and 92** on four tests. What is their average score? a) 85 b) 86.25 c) 87.5 d) 88
11. What is **30% of \$90**? a) \$20 b) \$25 c) \$27 d) \$30
12. Solve for **x**: **$7x + 3 = 38$** a) 5 b) 6 c) 7 d) 8
13. A rectangle has a length of **20 cm** and a width of **15 cm**. Find its perimeter. a) 70 cm b) 80 cm c) 90 cm d) 100 cm
14. A company's profit increased **\$3,000 per year** over **5 years**. What is the total increase? a) \$12,000 b) \$13,000 c) \$14,000 d) \$15,000
15. The average of **65, 75, 85, and 95** is: a) 75 b) 80 c) 85 d) 90

Answer Key:

Practice Test 1

1. 12
2. $x = 9$
3. 30 cm^2
4. \$3,000 increase
5. 2,520 meals
6. $3/10$
7. 29
8. 50 cm
9. 150 miles
10. \$40
11. $y = 6$
12. 153.86 cm^2
13. 86.25
14. 60 mph
15. $1/2$

Practice Test 2

1. c) \$60
2. c) 5
3. b) 180 cm^2
4. c) \$10,000
5. b) 83
6. c) $1/2$
7. b) 26
8. d) 60 mph
9. a) $1/2$
10. b) 86.25
11. c) \$27
12. b) 5
13. c) 90 cm
14. d) \$15,000

15. b) 80

Answers to Practice Exercises (Chapter 1)

Addition

1. $65 + 28 = 93$
2. $149 + 376 = 525$
3. $8,530 + 1,247 = 9,777$

Subtraction

4. $93 - 47 = 46$
5. $500 - 275 = 225$
6. $10,000 - 4,682 = 5,318$

Multiplication

7. $7 \times 8 = 56$
8. $23 \times 15 = 345$
9. $120 \times 35 = 4,200$

Division

10. $64 \div 8 = 8$
11. $144 \div 12 = 12$
12. $1,000 \div 25 = 40$

Answers to Practice Exercises (Chapter 2: Understanding Fractions and Decimals)

Fraction to Decimal Conversion

1. $1/4 = 0.25$
2. $2/5 = 0.4$
3. $7/8 = 0.875$
4. $5/6 = 0.833$ (rounded to three decimal places)
5. $9/10 = 0.9$

Decimal to Fraction Conversion

6. $0.2 = 2/10 \rightarrow 1/5$ (simplified)
7. $0.6 = 6/10 \rightarrow 3/5$ (simplified)
8. $0.125 = 125/1000 \rightarrow 1/8$ (simplified)
9. $0.375 = 375/1000 \rightarrow 3/8$ (simplified)
10. $0.8 = 8/10 \rightarrow 4/5$ (simplified)

Fraction Simplification

11. $12/16 = 3/4$
12. $45/60 = 3/4$
13. $100/125 = 4/5$
14. $18/24 = 3/4$
15. $50/75 = 2/3$

Answers to Practice Exercises (Chapter 3: Basic Algebra)

Solving for x

1. $x + 4 = 15 \rightarrow x = 11$
2. $5x = 25 \rightarrow x = 5$
3. $x - 9 = 20 \rightarrow x = 29$
4. $3x + 6 = 18 \rightarrow x = 4$
5. $x/3 = 7 \rightarrow x = 21$

Simplifying Expressions

6. $4x + 3x - 2 \rightarrow 7x - 2$
7. $5(x - 3) + 2x \rightarrow 5x - 15 + 2x = 7x - 15$
8. $6x^2 + 3x^2 - x \rightarrow 9x^2 - x$
9. $(x + 5)(x - 2) \rightarrow x^2 - 2x + 5x - 10 = x^2 + 3x - 10$
10. $2(x + 6) - 3(x - 1) \rightarrow 2x + 12 - 3x + 3 = -x + 15$

Answers to Practice Exercises (Chapter 4: Word Problems and Applications)

1. A book costs \$12. If you buy 5 books, what is the total cost? **Total cost = $12 \times 5 = 60$**
2. A train travels 60 miles per hour. How far does it travel in 3 hours? **Distance = $60 \times 3 = 180$ miles**
3. A bakery has 320 cupcakes and sells 75 each hour. How many are left after 4 hours?
Total sold = $75 \times 4 = 300$ Remaining = $320 - 300 = 20$ cupcakes
4. Sarah earns \$9 per hour at her job. If she works 8 hours per day for 5 days, how much does she earn in total? **Total earnings = $9 \times 8 \times 5 = 360$ dollars**
5. A rectangle has a length of 12 cm and a width of 5 cm. Find the area. **Area = $12 \times 5 = 60$ cm²**

Answers to Practice Exercises (Chapter 5: Geometry Essentials)

1. A square has sides of 6 cm. Find its area and perimeter. **Area = $6 \times 6 = 36$ cm²**
Perimeter = $4 \times 6 = 24$ cm
2. A triangle has a base of 8 cm and a height of 5 cm. Find its area. **Area = $(1/2) \times 8 \times 5 = 20$ cm²**
3. A circle has a radius of 3 cm. Find its area using $\pi \approx 3.14$. **Area = $\pi \times 3^2 = 3.14 \times 9 = 28.26$ cm²**
4. A rectangular prism has dimensions of 4 cm $\times$ 5 cm $\times$ 6 cm. Find its volume. **Volume = $4 \times 5 \times 6 = 120$ cm³**

5. A cube has a side length of 3 cm. Find its volume. **Volume** = $3^3 = 3 \times 3 \times 3 = 27 \text{ cm}^3$

Answers to Practice Exercises (Chapter 6: Linear Equations and Inequalities)

Solving for x

1. $3x + 4 = 19 \rightarrow x = (19 - 4) / 3 \rightarrow x = 5$
2. $5x - 8 = 17 \rightarrow x = (17 + 8) / 5 \rightarrow x = 5$
3. $2(x - 3) = 14 \rightarrow x - 3 = 14 / 2 \rightarrow x = 7 + 3 \rightarrow x = 10$
4. $x/4 + 7 = 12 \rightarrow x/4 = 12 - 7 \rightarrow x = (5 \times 4) \rightarrow x = 20$
5. $4(x + 2) = 28 \rightarrow x + 2 = 28 / 4 \rightarrow x = 7 - 2 \rightarrow x = 5$

Solving Inequalities

6. $x - 5 \geq 10 \rightarrow x \geq 10 + 5 \rightarrow x \geq 15$
7. $2x + 3 < 17 \rightarrow 2x < 17 - 3 \rightarrow x < 14 / 2 \rightarrow x < 7$
8. $4x - 6 > 10 \rightarrow 4x > 10 + 6 \rightarrow x > 16 / 4 \rightarrow x > 4$
9. $x/3 \leq 9 \rightarrow x \leq 9 \times 3 \rightarrow x \leq 27$
10. $5x + 8 \geq 28 \rightarrow 5x \geq 28 - 8 \rightarrow x \geq 20 / 5 \rightarrow x \geq 4$

Answers to Practice Exercises (Chapter 7: Data Interpretation)

Using the Sales Table

Month	Sales (\$)
January	5,000
February	7,500
March	6,000
April	8,000
May	7,200

1. **Total sales amount from January to May:** $5,000 + 7,500 + 6,000 + 8,000 + 7,200 = 33,700$ dollars
2. **Average (mean) sales amount:** $(5,000 + 7,500 + 6,000 + 8,000 + 7,200) \div 5 = 6,740$ dollars
3. **Month with the highest sales:** April (8,000 dollars)
4. **Month with the lowest sales:** January (5,000 dollars)
5. **Projected sales for June with a 10% increase:** May's sales: 7,200 10% increase: $7,200 \times 0.10 = 720$ New total: $7,200 + 720 = 7,920$ dollars

Answers to Practice Exercises (Chapter 8: Applied Math Problems)

1. A bicycle costs \$250. If there is a 15% discount, what is the sale price? **Sale price** = $250 - (250 \times 0.15) = 250 - 37.50 = 212.50$

- A factory produces 500 boxes per day. How many boxes will be produced in 8 days?
Total boxes = $500 \times 8 = 4,000$ boxes
- A recipe uses 4 cups of flour for 6 servings. How many cups of flour are needed for 12 servings? **Flour needed = $(4 \times 12) \div 6 = 8$ cups**
- A runner completes 5 miles per hour. How many miles will they run in 2.5 hours? **Total miles = $5 \times 2.5 = 12.5$ miles**
- If a car gets 30 miles per gallon, how many gallons of gas are needed to travel 450 miles?
Gallons needed = $450 \div 30 = 15$ gallons

Answers to Practice Exercises (Chapter 9: Quadratics and Exponents)

Solving Quadratic Equations

- $x^2 + 7x + 10 = 0 \rightarrow (x + 5)(x + 2) \rightarrow x = -5, x = -2$
- $x^2 - 4x - 12 = 0 \rightarrow (x - 6)(x + 2) \rightarrow x = 6, x = -2$
- $x^2 + 9x + 20 = 0 \rightarrow (x + 4)(x + 5) \rightarrow x = -4, x = -5$
- $x^2 - 6x + 8 = 0 \rightarrow (x - 4)(x - 2) \rightarrow x = 4, x = 2$
- $x^2 + 5x - 24 = 0 \rightarrow (x + 8)(x - 3) \rightarrow x = -8, x = 3$

Simplifying Exponent Expressions

- $x^3 \times x^4 \rightarrow x^7$
- $y^6 \div y^2 \rightarrow y^4$
- $(a^2)^3 \rightarrow a^6$
- $b^4 \times b^2 \div b^3 \rightarrow b^3$
- $(x^5)^2 \rightarrow x^{10}$

Answers to Practice Exercises (Chapter 10: Probability and Statistics)

Probability Problems

- A bag has 3 yellow, 5 blue, and 2 green marbles. What is the probability of picking a blue marble? **Probability = $5 / (3 + 5 + 2) = 5/10 = 0.5$ (or 50%)**
- A spinner has 4 equal sections: A, B, C, and D. What is the probability of landing on C? **Probability = $1/4 = 0.25$ (or 25%)**
- A deck contains 8 red, 12 blue, and 10 green cards. What is the probability of picking a red card? **Probability = $8 / (8 + 12 + 10) = 8/30 = 0.267$ (or 26.7%)**
- A six-sided die is rolled. What is the probability of getting an even number? **Probability = $3/6 = 0.5$ (or 50%)**
- A box has 10 pens, and 4 are broken. What is the probability of choosing a working pen? **Probability = $(10 - 4)/10 = 6/10 = 0.6$ (or 60%)**

Statistics Problems

- Find the mean of: 7, 12, 15, 20, 30 **Mean = $(7 + 12 + 15 + 20 + 30) / 5 = 84 / 5 = 16.8$**
- Find the median of: 18, 25, 29, 40, 50, 55 **Median = $(29 + 40) / 2 = 34.5$**

8. Find the mode of: 12, 17, 22, 12, 19, 12, 24 **Mode = 12 (most frequently occurring value)**
9. Find the range of: 4, 9, 12, 20, 32, 45 **Range = $45 - 4 = 41$**
10. Find the mean of: 4, 8, 16, 24, 32 **Mean = $(4 + 8 + 16 + 24 + 32) / 5 = 84 / 5 = 16.8$**

Answers to Practice Exercises (Chapter 11: Multi-Step Problem Solving)

1. A school orders 360 books. If each classroom gets 45 books, how many classrooms receive books? **Classrooms = $360 \div 45 = 8$ classrooms**
2. A runner completes 5 miles per hour. How many miles will they run in 3.5 hours? **Total miles = $5 \times 3.5 = 17.5$ miles**
3. A store has 250 shirts in stock. If they sell 30 shirts per day, how many days until only 40 shirts are left? **Shirts remaining = $250 - 40 = 210$ Days needed = $210 \div 30 = 7$ days**
4. A rectangle has a length of 12 cm and a width of 8 cm. Find its area and perimeter. **Area = $12 \times 8 = 96 \text{ cm}^2$ Perimeter = $2(12 + 8) = 40 \text{ cm}$**
5. A restaurant makes 240 pizzas each week. If half are cheese and the rest are pepperoni, how many pepperoni pizzas are made in 4 weeks? **Weekly pepperoni pizzas = $240 \div 2 = 120$ Total pepperoni pizzas in 4 weeks = $120 \times 4 = 480$ pizzas**

Answers to Practice Exercises (Chapter 12: GED/HiSET Test Strategies)

1. If $x = 5$, what is the value of $2x^2 - 3x + 7$? **$2(5^2) - 3(5) + 7 = 2(25) - 15 + 7 = 50 - 15 + 7 = 42$**
2. A store discounts items by 30%. If a shirt costs \$25, what is the final price? **Final price = $25 - (25 \times 0.30) = 25 - 7.50 = 17.50$**
3. Solve for y in the equation: $3y + 6 = 24$ **$3y = 24 - 6 \rightarrow y = 18 / 3 \rightarrow y = 6$**
4. A rectangle has a length of 14 cm and a width of 9 cm. Find its area. **Area = $14 \times 9 = 126 \text{ cm}^2$**
5. A graph shows that a company's profits increased from \$4,000 to \$6,500 in one year. What is the total increase in profit? **Total increase = $6,500 - 4,000 = 2,500$ dollars**