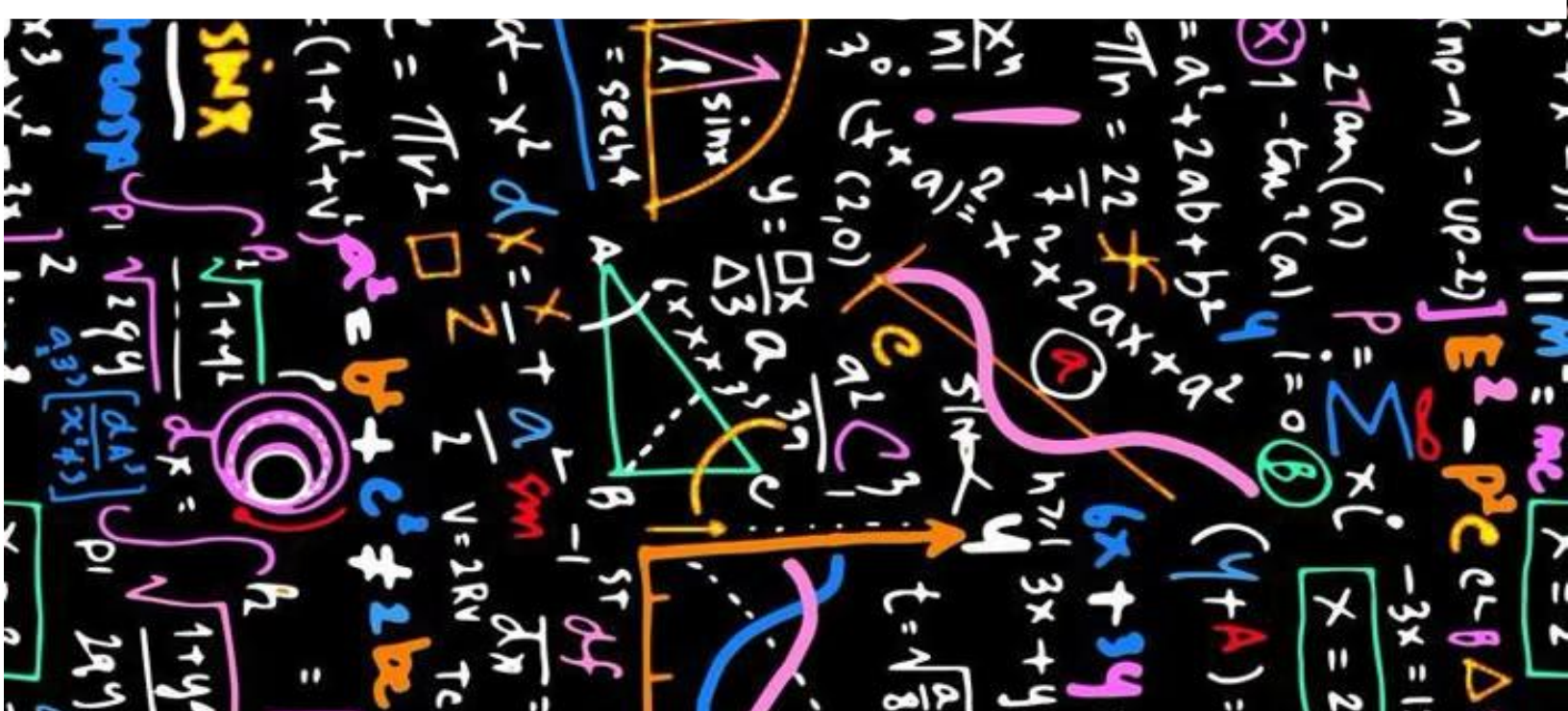




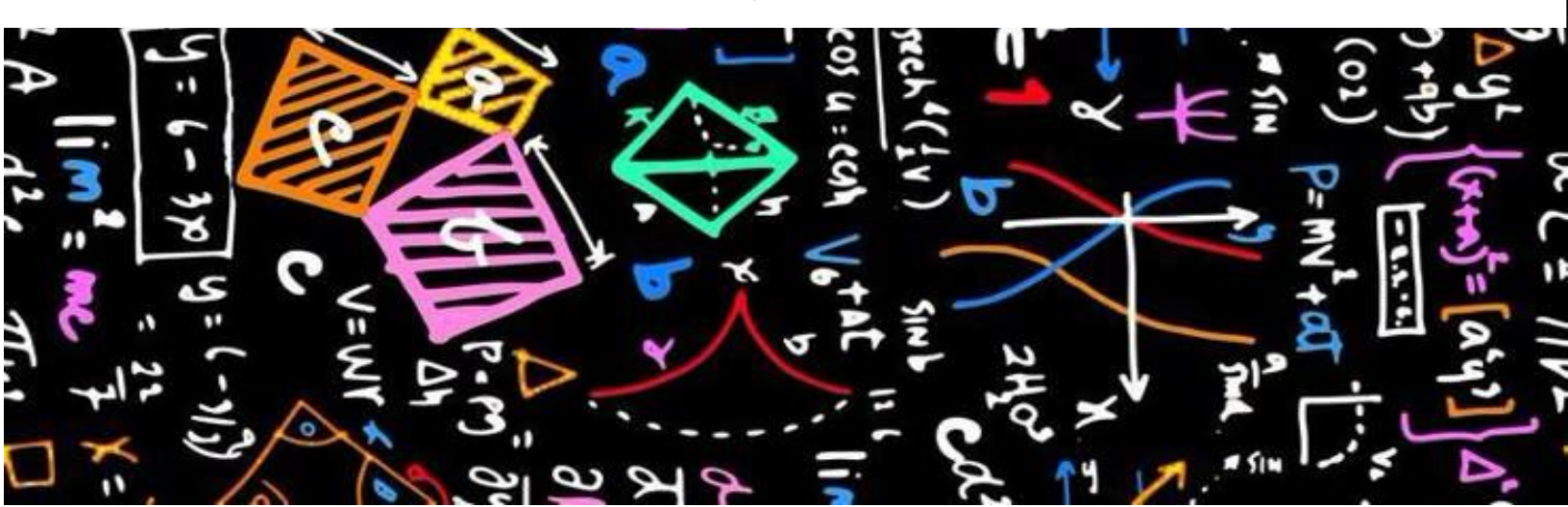
GED/HiSET Math Power

Strengthen Skills & Boost Scores



A Step-by-Step Workbook to Mastering Core
Math Concepts

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Chapter 1: Understanding Numbers

Concept Explanation

Understanding numbers is essential for problem-solving in mathematics. This chapter covers whole numbers, integers, number operations, and place value to ensure a strong foundation for advanced topics.

Key Number Concepts

Whole Numbers vs. Integers Whole numbers include zero and all positive numbers (0, 1, 2, 3...). Integers include both positive and negative numbers (... -3, -2, -1, 0, 1, 2, 3...).

Example: A company earned \$12,500 in January but recorded a \$4,200 loss in February. What is its total profit or loss after two months?

Place Value Place value determines the value of a digit in a number.

Example: The number 78,431 has

- 7 in the ten-thousands place
- 8 in the thousands place
- 4 in the hundreds place
- 3 in the tens place
- 1 in the ones place

If the digit 4 is replaced with 9, how much does the number change?

Basic Operations (Multi-Step Problems) Mastering addition, subtraction, multiplication, and division is necessary for solving complex problems.

Solve the following:

- A store sold 3,275 units in January, 4,563 in February, and 5,948 in March. What is the total number of units sold?
- A warehouse starts with 8,942 packages and ships out 3,187. How many remain?
- A factory produces 365 items per day. How many are produced in three weeks (21 days)?

- A scholarship fund of \$45,000 is divided among 360 students. How much does each student receive?

Practice Exercises

Solve without guidance on which operation to use.

1. A construction company builds 84 houses per year. How many houses are built in 8 years?
2. A business starts with 9,150 customers. After six months, 3,845 leave. How many customers remain?
3. A printer produces 7,250 pages per hour. How many pages are printed in 18 hours?
4. A \$750,000 contract is split among 5 contractors. How much does each receive?
5. A delivery service covers 1,225 miles per week. How many miles does it cover in 15 weeks?

Real-World Applications

Mathematics is used in industries such as finance, construction, and engineering.

Example: A warehouse stores **7 rows of 14 boxes each**. How many boxes are in the warehouse? **Solution:** Multiply the total rows by the number of boxes per row: $7 \times 14 = 98$ The warehouse contains **98 boxes**.

GED/HiSET-Style Quiz

Multiple-Choice Questions

1. A store sells 12,845 items in April and 9,432 items in May. What is the total number of items sold? a) 21,277 b) 22,277 c) 23,277 d) 24,277
2. A company reports \$46,800 in revenue in Q1 and \$39,350 in Q2. What is the total revenue after two quarters? a) \$85,150 b) \$86,150 c) \$87,150 d) \$88,150
3. A factory produces 2,150 units daily. How many units are produced in 14 days? a) 28,100 b) 29,100 c) 30,100 d) 31,100
4. A laptop originally costs \$1,800, but is discounted by 15%. What is the new price? a) \$1,530 b) \$1,550 c) \$1,620 d) \$1,650

5. A construction project requires 8,750 bricks per building. How many bricks are needed for 30 buildings? a) 250,500 b) 262,500 c) 275,500 d) 288,500

Answer Key

1. b) 22,277
2. c) \$87,150
3. a) 28,100 units
4. a) \$1,530
5. b) 262,500

Chapter 2: Fractions and Decimals

Concept Explanation

Fractions and decimals represent parts of a whole. Understanding how to convert, simplify, and apply them is essential for solving mathematical problems efficiently.

Key Number Concepts

Fractions: A fraction consists of a **numerator** (top number) and a **denominator** (bottom number). Example: In $\frac{3}{4}$, the numerator is **3**, and the denominator is **4**, meaning 3 out of 4 equal parts.

Decimals: Decimals represent fractions in **base-10 form**. Example: The fraction $\frac{1}{2}$ is equivalent to **0.5** in decimal form.

Converting Between Fractions and Decimals:

- To convert a **fraction to a decimal**, divide the numerator by the denominator. Example: Convert $\frac{7}{8}$ to a decimal $\rightarrow 7 \div 8 = 0.875$
- To convert a **decimal to a fraction**, write the decimal as a fraction and simplify. Example: Convert **0.75** to a fraction $\rightarrow \frac{75}{100} = \frac{3}{4}$

Simplifying Fractions: To simplify a fraction, divide both the numerator and denominator by their greatest common factor (GCF). Example: $\frac{16}{24} \rightarrow$ GCF is **8**
 $\rightarrow (16 \div 8) / (24 \div 8) = \frac{2}{3}$

Comparing and Ordering Fractions and Decimals: Use equivalent fractions or decimals to compare numbers. Example: Compare $\frac{3}{5}$ and **0.6** Convert $\frac{3}{5}$ to a decimal $\rightarrow 3 \div 5 = 0.6$ Since **0.6 = 0.6**, these values are equal.

Practice Exercises

Solve without guidance on which operation to use.

1. A recipe calls for $\frac{3}{4}$ cup of flour. If a chef triples the recipe, how much flour is needed?
2. Convert $\frac{9}{16}$ into a decimal.
3. A store discounts a \$50 item by 0.2 (20%). What is the new price?
4. Simplify the fraction $\frac{56}{72}$.

5. Arrange in ascending order: $\frac{5}{8}$, 0.75, $\frac{3}{4}$, 0.6.

Real-World Applications

Fractions and decimals appear in **money, measurements, and probability**.

Example: A store is offering a **30% discount** on a **\$80 jacket**. What is the sale price? **Solution:** Find the discount amount: $80 \times 0.30 = 24$ Subtract from the original price: $80 - 24 = 56$ The sale price of the jacket is **\$56**.

GED/HiSET-Style Quiz

Multiple-Choice Questions

1. Convert $\frac{5}{16}$ to a decimal. a) 0.3125 b) 0.325 c) 0.350 d) 0.375
2. A pizza is divided into 8 equal slices. If 5 slices are eaten, what fraction remains? a) $\frac{5}{8}$ b) $\frac{3}{8}$ c) $\frac{1}{8}$ d) $\frac{7}{8}$
3. Convert 0.45 into a fraction in simplest form. a) $\frac{45}{100}$ b) $\frac{9}{20}$ c) $\frac{4}{9}$ d) $\frac{5}{12}$
4. Order these from smallest to largest: $\frac{7}{10}$, 0.65, $\frac{3}{5}$, $\frac{2}{3}$. a) $\frac{3}{5}$, 0.65, $\frac{2}{3}$, $\frac{7}{10}$ b) 0.65, $\frac{3}{5}$, $\frac{2}{3}$, $\frac{7}{10}$ c) $\frac{3}{5}$, $\frac{2}{3}$, 0.65, $\frac{7}{10}$ d) $\frac{2}{3}$, $\frac{3}{5}$, $\frac{7}{10}$, 0.65
5. A worker completes $\frac{2}{5}$ of a project on Monday and $\frac{1}{4}$ on Tuesday. How much of the project is completed? a) $\frac{9}{20}$ b) $\frac{3}{10}$ c) $\frac{7}{20}$ d) $\frac{3}{5}$

Answer Key

1. a) 0.3125
2. b) $\frac{3}{8}$
3. b) $\frac{9}{20}$
4. a) $\frac{3}{5}$, 0.65, $\frac{2}{3}$, $\frac{7}{10}$
5. a) $\frac{9}{20}$

Chapter 3: Basic Algebra

Concept Explanation

Algebra provides a systematic approach to solving problems by using symbols, variables, and mathematical operations. A strong foundation in algebra is essential for tackling advanced math concepts and real-world applications.

Key Number Concepts

Variables and Expressions: A variable is a **letter or symbol** that represents an unknown value in an equation. Example: In $x + 5 = 12$, the variable x represents an unknown number.

Solving for x: To isolate x , use inverse operations. Example: Solve $2x - 4 = 10$
Step 1: Add 4 to both sides $\rightarrow 2x = 14$ Step 2: Divide by 2 $\rightarrow x = 7$

Combining Like Terms: Terms that have the **same variable** can be simplified. Example: $4x + 3x - 2 = ?$ Combine $4x$ and $3x \rightarrow 7x - 2$

Applying the Distributive Property: The distributive property allows multiplication across parentheses. Example: $3(2x - 5) = ?$ Distribute 3 $\rightarrow 6x - 15$

Writing and Solving Equations: Translate word problems into algebraic equations. Example: A taxi charges **\$2 per mile** plus a **\$5 base fee**. If a ride costs **\$23**, how many miles were traveled? Equation: $2m + 5 = 23$ Solve: $m = 9$ miles

Practice Exercises

Solve without guidance on which operation to use.

1. Simplify: $5x + 7x - 9$
2. Solve for x : $3x - 12 = 27$
3. Apply the distributive property: $4(3x - 8)$
4. Evaluate: If $y = 6$, what is the value of $4y - 3$?
5. A store sells shirts for \$12 each. If a customer spends \$84, how many shirts were purchased?

Real-World Applications

Algebra is used in **finance, engineering, and technology** to model relationships and solve practical problems.

Example: A freelancer earns **\$75 per project**. If they complete **15 projects**, how much will they earn? **Solution:** Multiply the number of projects by the earnings per project: $75 \times 15 = 1,125$ The freelancer earns **\$1,125**.

GED/HiSET-Style Quiz

Multiple-Choice Questions

1. Solve for x: $x - 3 = 18$ a) 12 b) 15 c) 18 d) 21
2. Simplify: $2x + 4x - 11$ a) $6x - 11$ b) $6x + 11$ c) $4x - 11$ d) $2x + 11$
3. Apply the distributive property: $5(2x + 3)$ a) $10x + 3$ b) $10x + 15$ c) $10x - 15$ d) $10x + 5$
4. If $y = 7$, find the value of $5y - 6$. a) 29 b) 31 c) 33 d) 35
5. Solve for x: $9x - 5 = 40$ a) 3 b) 4 c) 5 d) 6

Answer Key

1. d) 21
2. a) $6x - 11$
3. b) $10x + 15$
4. a) 29
5. c) 5

Chapter 4: Word Problems and Applications

Concept Explanation

Word problems require translating real-life situations into mathematical equations. Strong problem-solving skills help students analyze, set up, and solve equations efficiently.

Key Number Concepts

Understanding Word Problems: Identify key information, determine the necessary operations, and write an equation.

Example: A store sells three types of fruit: apples, bananas, and oranges. If they sell 125 apples, 150 bananas, and 175 oranges, how many pieces of fruit were sold in total?

Solution: To find the total number of fruits sold, add the values together: $125 + 150 + 175 = 450$ Thus, the store sold 450 pieces of fruit.

Writing and Solving Equations: Convert word problems into mathematical expressions.

Example: A contractor charges \$500 per project plus a \$75 consultation fee. If a client pays \$1,575, how many projects were completed?

Solution: Step 1: Write an equation using p for the number of projects: $500p + 75 = 1,575$

Step 2: Isolate p by subtracting 75 from both sides: $500p = 1,500$

Step 3: Divide both sides by 500: $p = 3$

Thus, the contractor completed three projects.

Multi-Step Word Problems: Some problems require multiple operations to reach a solution.

Example: A company produces 85 items per day. After two weeks, production increases by 20%. How many items were produced in the second week?

Solution: Step 1: Find the production before the increase: $85 \text{ items/day} \times 7 \text{ days} = 595 \text{ items}$

Step 2: Increase production by 20%: $595 \times 0.20 = 119 \text{ additional items}$

Step 3: Find the new total: $595 + 119 = 714$

Thus, in the second week, the company produced 714 items.

Practice Exercises

Solve without guidance on which operation to use.

1. A farm has 230 chickens, 85 cows, and 140 sheep. How many animals are on the farm?
2. A printing company produces 1,750 brochures per week. How many will they produce in eight weeks?
3. A customer pays \$48 for a pair of shoes after a 15% discount. What was the original price?
4. A delivery truck travels 1,250 miles in five days. What is the average distance traveled per day?
5. A factory makes 325 products daily but increases production by 35% after two months. How many products are made after the increase?

Real-World Applications

Word problems appear in finance, logistics, and business planning.

Example: A store sells a **package of pens** for **\$4.25 each**. If a customer buys **24 packages**, what is the total cost? **Solution:** Multiply the price per package by the number of packages: $4.25 \times 24 = 102$ The total cost is **\$102**.

GED/HiSET-Style Quiz

Multiple-Choice Questions

1. A store purchases 1,250 units at \$6.25 each. What is the total cost? a) \$7,500
b) \$8,125 c) \$7,812.50 d) \$8,250

2. A contractor builds 15 houses per year. How many houses are built in nine years? a) 125 b) 135 c) 145 d) 155
3. A \$400 jacket is marked down 25%. What is the sale price? a) \$275 b) \$300 c) \$320 d) \$350
4. A factory produces 1,825 units per week. How many units are produced in ten weeks? a) 17,250 b) 18,250 c) 19,250 d) 20,250
5. A car rental company charges \$35 per day plus a \$50 flat fee. If a customer pays \$290, how many days was the car rented? a) five b) six c) seven d) eight

Answer Key

1. c) \$7,812.50
2. b) 135
3. b) \$300
4. b) 18,250
5. c) seven

Intermediate Level

Chapter 5: Geometry Essentials

Concept Explanation

Geometry is the study of shapes, sizes, angles, and positions of objects. Understanding basic geometry helps with real-world applications like building design, navigation, and everyday problem-solving. This chapter covers **lines, angles, shapes, area, perimeter, volume, and coordinate plane concepts** to build a strong foundation.

Lines, Angles, and Shapes

- **Lines**
 - **Parallel lines** never intersect and run in the same direction forever (like railroad tracks).
 - **Perpendicular lines** cross at a **90-degree angle**, forming a perfect "L" shape.
 - **Intersecting lines** meet at some point, forming an angle.
- **Angles**
 - **Acute angles** are less than **90 degrees**.
 - **Right angles** are exactly **90 degrees**.
 - **Obtuse angles** are greater than **90 degrees** but less than **180 degrees**.
 - **Straight angles** measure exactly **180 degrees**.
- **Shapes**
 - **Triangles** have **three sides** and can be classified as **equilateral** (all sides equal), **isosceles** (two sides equal), or **scalene** (no equal sides).
 - **Quadrilaterals** have **four sides** and include **squares, rectangles, parallelograms, and trapezoids**.
 - **Circles** are defined by **radius, diameter, and circumference**.

Example Problem: A triangle has angles measuring **45 degrees** and **65 degrees**. What is the measure of the third angle?

Area, Perimeter, and Volume

- **Perimeter (Distance Around a Shape)**
 - Rectangle: $P = 2(\text{length} + \text{width})$
 - Triangle: $P = \text{side1} + \text{side2} + \text{side3}$
- **Area (Space Inside a Shape)**
 - Rectangle: $A = \text{length} \times \text{width}$
 - Triangle: $A = (\text{base} \times \text{height}) \div 2$

- Circle: $A = \pi \times \text{radius}^2$
- **Volume (Space Inside a 3D Shape)**
 - Cube: $V = \text{side}^3$
 - Cylinder: $V = \pi \times \text{radius}^2 \times \text{height}$
 - Sphere: $V = (4/3) \times \pi \times \text{radius}^3$

Example Problem: A rectangular yard measures **12 feet by 8 feet**. What is its area?

Basic Coordinate Plane Concepts

The **coordinate plane** is a grid used to plot points.

- The **X-axis** is the horizontal line.
- The **Y-axis** is the vertical line.
- **Ordered pairs (x, y)** describe positions (example: **(3, -2)** means move **3 steps right and 2 steps down**).
- The plane is divided into **four quadrants** based on positive and negative values.

Example Problem: Plot the point **(4, -3)** on the coordinate plane. In which quadrant does it lie?

Word Problems and Applications

Geometry is widely used in **architecture, engineering, and business**.

Example: Carpet Installation A room measures **10 feet by 12 feet**. If carpeting costs **\$3 per square foot**, how much will it cost to carpet the whole room?

Solution:

- Area = $10 \times 12 = 120$ **square feet**
- Total cost = $120 \times 3 = \$360$ The total cost to carpet the room is **\$360**.

Practice Problems

Solve the following:

1. A square has a side length of 9 cm. What is its perimeter?
2. A triangle has a base of 10 cm and height of 12 cm. What is its area?

3. A cylinder has a radius of 5 cm and height of 10 cm. What is its volume?
4. A circle has a radius of 7 cm. What is its area?
5. A rectangular prism has dimensions 6 cm $\times$ 4 cm $\times$ 3 cm. What is its volume?

GED/HiSET-Style Quiz

Multiple-Choice Questions

1. A square has sides measuring 5 cm. What is its area? a) 10 cm² b) 25 cm² c) 30 cm² d) 50 cm²
2. A builder is constructing four rectangular patios, each measuring 6 feet by 9 feet. What is the total area of the patios? a) 216 square feet b) 220 square feet c) 230 square feet d) 250 square feet
3. A circular swimming pool has a radius of 10 feet. What is its area? a) 100 π square feet b) 110 π square feet c) 120 π square feet d) 130 π square feet
4. A classroom measures 8 meters $\times$ 12 meters. What is its area? a) 80 square meters b) 90 square meters c) 96 square meters d) 100 square meters
5. A cube has a side length of 4 cm. What is its volume? a) 16 cm³ b) 32 cm³ c) 48 cm³ d) 64 cm³

Answer Key

1. b) 25 cm^2
2. a) 216 square feet
3. a) 100π square feet
4. c) 96 square meters
5. d) 64 cm^3

Chapter 6: Linear Equations and Inequalities

Concept Explanation

Linear equations and inequalities describe relationships between numbers using symbols and operations. These equations involve terms like addition, subtraction, multiplication, and division, and they are used in everyday situations such as calculating costs, distances, and time. This chapter explains how to **write and solve linear equations, graph solutions, and apply these concepts in real life.**

Key Concepts

How to Write and Solve a Linear Equation A linear equation looks like this: $5x + 4 = 29$

To solve for x , follow these steps:

1. **Subtract 4** from both sides: $5x = 25$
2. **Divide by 5** to get x by itself: $x = 5$

Graphing Solutions A linear equation can be drawn on a graph as a **straight line**. The equation follows the format $y = mx + b$, where:

- m is the **slope**, showing how steep the line is.
- b is the **y-intercept**, the point where the line crosses the y-axis.

Example Problem: Graph $y = 2x + 3$

- The **slope** is **2**, meaning the line rises by 2 for every step to the right.
- The **y-intercept** is **3**, meaning the line crosses the y-axis at (0,3).

Understanding Inequalities An **inequality** shows a range of possible values rather than one single solution. The most common symbols used are:

- " $<$ " (less than)
- " $>$ " (greater than)
- " $\leq$ " (less than or equal to)
- " $\geq$ " (greater than or equal to)

Example Problem: Solve $2x - 4 > 10$

1. **Add 4** to both sides: $2x > 14$

2. Divide by 2: $x > 7$

The answer means that x can be any number greater than 7.

Practice Problems

Solve the following problems step by step:

1. $4x + 3 = 19$
2. $2x - 7 = 15$
3. Graph $y = -3x + 2$
4. Solve $5x + 4 \leq 29$
5. Solve $6x - 9 > 15$

Real-World Applications

Linear equations and inequalities appear in many areas like **business, budgeting, and construction**.

Example: Business Pricing A store sells **shoes for \$50 each**. The total earnings from selling x shoes is given by the equation $E = 50x$. How much does the store make if they sell **10 pairs of shoes**?

Solution: Multiply $50 \times 10 = 500$ The store makes **\$500** in total.

GED/HiSET-Style Quiz

Multiple-Choice Questions

1. A repair service charges \$30 per hour plus a \$40 base fee. If a job takes 6 hours, what is the total charge? a) \$180 b) \$190 c) \$200 d) \$220
2. A jacket originally cost \$120, but is on sale for 25% off. What is the sale price? a) \$85 b) \$90 c) \$95 d) \$100
3. A landscaper charges \$15 per square foot to lay new grass. If a yard is 60 square feet, how much will it cost? a) \$800 b) \$850 c) \$900 d) \$950
4. Solve $3x + 9 = 30$ a) $x = 5$ b) $x = 7$ c) $x = 9$ d) $x = 11$
5. Solve $5x - 4 \leq 21$ a) x is less than or equal to 5 b) x is less than or equal to 6 c) x is less than or equal to 7 d) x is less than or equal to 8

Answer Key

1. c) \$200
2. d) \$90
3. c) \$900
4. a) $x = 7$
5. c) x is less than or equal to 7

Chapter 7: Data Interpretation

Concept Explanation

Data interpretation involves reading and analyzing information from tables, graphs, and charts to make informed decisions. Understanding data helps in fields like finance, business, science, and everyday life. This chapter covers **how to read tables, graphs, and charts, calculate mean, median, and mode, and explore basic probability concepts.**

Key Concepts

Reading and Analyzing Tables, Graphs, and Charts

- **Tables** present numerical data in rows and columns for easy comparison.
- **Bar Graphs** use bars of different heights or lengths to represent values.
- **Line Graphs** track changes over time by connecting data points with a line.
- **Pie Charts** display proportions as sections of a circle.

Example Problem: A table shows the number of customers visiting a store each month:

- January: **520**
- February: **630**
- March: **480**
- April: **720**

Which month had the highest number of customers?

Mean, Median, and Mode Calculations

- **Mean (Average):** Add all numbers and divide by the total count.
- **Median (Middle Value):** Arrange numbers from smallest to largest and find the middle value.
- **Mode (Most Frequent Number):** Identify the number that appears the most.

Example Problem: Find the mean of the following scores: **85, 90, 75, 80, 95**
Solution:

1. Add the values: **$85 + 90 + 75 + 80 + 95 = 425$**

2. Divide by the total count (5): $425 \div 5 = 85$ The mean is 85.

Basic Probability Concepts

Probability measures the chance of an event happening, written as a fraction, decimal, or percentage.

- Probability formula: **Probability = (Desired outcomes) $\div$ (Total outcomes)**

Example Problem: A bag contains 5 red, 3 blue, and 2 green marbles. What is the probability of randomly picking a blue marble? **Solution:** Total marbles = $5 + 3 + 2 = 10$ Blue marbles = 3 Probability = $3 \div 10$ or 30%

Word Problems and Applications

Data interpretation is used in **business, health, sports, and technology**.

Example: Business Sales Analysis A company tracks monthly revenue:

- January: \$12,500
- February: \$15,000
- March: \$11,750

What is the **average monthly revenue**?

Solution: Add values: $\$12,500 + \$15,000 + \$11,750 = \$39,250$ Divide by 3: $\$39,250 \div 3 = \$13,083.33$ The average monthly revenue is \$13,083.33.

Practice Problems

1. A bar graph shows the number of books read by students in five months: 8, 10, 6, 12, and 9. Find the mean number of books read per month.
2. A company sold 250 units in Q1, 340 in Q2, and 290 in Q3. Find the average sales per quarter.
3. A school records test scores: 72, 85, 90, 78, 85, and 95. Find the mode.
4. A bag contains 12 balls: 7 red, 3 blue, and 2 yellow. What is the probability of randomly picking a yellow ball?
5. A store surveys customers about their favorite product. The results show Product A: 35%, Product B: 50%, and Product C: 15%. Which product is most popular?

GED/HiSET-Style Quiz

Multiple-Choice Questions

1. A student's test scores are 78, 82, 95, 88, and 91. What is the mean? a) 87 b) 88 c) 89 d) 90
2. A survey asked 500 people about their favorite restaurant: 200 chose Italian, 150 chose Mexican, and 150 chose Chinese. What percentage preferred Italian food? a) 35% b) 40% c) 45% d) 50%
3. A store tracks monthly customer visits: Jan: 540, Feb: 610, Mar: 580, Apr: 670. What is the median number of visits? a) 575 b) 595 c) 600 d) 620
4. A bag has 10 marbles: 4 red, 3 blue, and 3 green. What is the probability of selecting a red marble? a) 30% b) 35% c) 40% d) 45%
5. A line graph tracks temperature over four days: Monday: 72°F, Tuesday: 78°F, Wednesday: 75°F, Thursday: 80°F. What is the average temperature? a) 75°F b) 76°F c) 77°F d) 78°F

Answer Key

1. b) 88
2. b) 40%
3. c) 600
4. c) 40%
5. b) 76°F

Chapter 8: Applied Math Problems

Concept Explanation

Applied math connects numbers and formulas to real-world situations. Whether in **finance, business, construction, or everyday problem-solving**, knowing how to work with ratios, proportions, and formulas helps make practical decisions. This chapter covers **how to apply math in financial scenarios, calculate ratios and proportions, and use formulas effectively**.

Key Concepts

Practical Scenarios in Finance, Business, and Daily Life Math is often used for budgeting, shopping, investments, and business planning.

- **Budgeting:** Tracking expenses and comparing income vs. spending.
- **Shopping:** Calculating discounts and total costs.
- **Business:** Setting prices, estimating profits, and analyzing revenue trends.

Example Problem: A jacket costs \$80, and there is a **20% discount**. What is the sale price? **Solution:**

1. Find the discount: **20% of 80 = $80 \times 0.20 = \$16$**
2. Subtract from the original price: **$\$80 - \$16 = \$64$** The sale price is **\$64**.

Understanding Ratios and Proportions

- **Ratios** compare two quantities: **A store has 3 managers for every 15 employees**, written as **3:15** or **1:5**.
- **Proportions** show equivalent relationships: **If 2 cups of flour make 12 cookies, how much flour is needed for 36 cookies?**

Example Problem: A car travels **120 miles in 2 hours**. How far will it go in **5 hours** at the same speed? **Solution:**

1. Set up a proportion: **120 miles / 2 hours = x miles / 5 hours**
2. Solve for x: **$x = (120 \times 5) \div 2 = 300$ miles** The car will travel **300 miles** in 5 hours.

Using Formulas Effectively

- **Simple Interest:** $\text{Interest} = \text{Principal} \times \text{Rate} \times \text{Time}$
- **Area of a Circle:** $A = \pi \times \text{radius}^2$
- **Speed Formula:** $\text{Speed} = \text{Distance} \div \text{Time}$

Example Problem: A bank offers **5% annual interest** on a **\$1,200 deposit**. How much interest will it earn in **3 years**? **Solution:**

1. Use **Interest = Principal $\times$ Rate $\times$ Time**
2. **Interest = \$1,200 $\times$ 0.05 $\times$ 3 = \$180** The deposit will earn **\$180** in interest.

Practice Problems

Solve the following:

1. A store offers a 30% discount on a \$50 item. What is the final price?
2. A business makes \$8,500 in sales each month. What is the total revenue for a year?
3. A recipe calls for 4 cups of flour to make 24 cookies. How much flour is needed for 48 cookies?
4. A runner completes 18 miles in 3 hours. What is their speed per hour?
5. A loan of \$2,000 has an interest rate of 6% per year. How much interest will it earn in 4 years?

GED/HiSET-Style Quiz

Multiple-Choice Questions

1. A sofa costs \$750, but a sale reduces the price by 15%. What is the new price? a) \$612.50 b) \$625.00 c) \$637.50 d) \$650.00
2. A warehouse has 400 boxes, and 10% are damaged. How many are not damaged? a) 340 b) 360 c) 380 d) 400
3. A contractor needs 8 gallons of paint for every 300 square feet. How many gallons are needed for 900 square feet? a) 16 gallons b) 20 gallons c) 24 gallons d) 30 gallons
4. A savings account earns 4% annual interest on \$2,500. How much interest will it earn in 2 years? a) \$160 b) \$180 c) \$200 d) \$220
5. A bike travels 48 miles in 3 hours. What is its speed per hour? a) 12 mph b) 14 mph c) 16 mph d) 18 mph

Answer Key

1. c) \$637.50
2. c) 380
3. b) 24 gallons
4. c) \$200
5. c) 16 mph

Advanced Level

Chapter 9: Quadratics and Exponents

Concept Explanation

Quadratic equations and exponents are essential in advanced math, helping to model real-world situations like finance, physics, and engineering. This chapter covers **how to solve quadratic equations, apply exponent rules, and understand scientific notation and growth patterns.**

Key Concepts

Understanding and Solving Quadratic Equations A quadratic equation is an equation where the highest power of the variable is 2. The general form is: $ax^2 + bx + c = 0$

To solve quadratic equations, we use different methods:

- **Factoring:** Breaking the equation into smaller parts.
- **Quadratic Formula:** $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
- **Completing the Square:** Rearranging the equation to find x.
- **Graphing:** Plotting the equation to find where it crosses the x-axis.

Example Problem: Solve $x^2 + 5x + 6 = 0$ by factoring. **Solution:**

1. Find two numbers that multiply to 6 and add to 5 → (2 and 3)
2. Rewrite the equation: $(x + 2)(x + 3) = 0$
3. Solve: $x + 2 = 0 \rightarrow x = -2$, $x + 3 = 0 \rightarrow x = -3$ The solutions are $x = -2$ and $x = -3$.

Applying Exponent Rules Exponents tell us how many times to multiply a number by itself. Common exponent rules include:

- **Multiplication Rule:** $x^n \times x^m = x^{n+m}$
- **Division Rule:** $x^n \div x^m = x^{n-m}$
- **Power Rule:** $(x^n)^m = x^n \times m$
- **Zero Exponent Rule:** $x^0 = 1$
- **Negative Exponent Rule:** $x^{-n} = 1 / x^n$

Example Problem: Simplify $(2^3 \times 2^2)$ **Solution:** $2^3 \times 2^2 = 2^{3+2} = 2^5 = 32$

Scientific Notation and Growth Patterns Scientific notation is a way to write very large or very small numbers using exponents.

- **Format:** $a \times 10^n$
- **Example:** 3,500,000 in scientific notation is 3.5×10^6
- **Example:** 0.0042 in scientific notation is 4.2×10^{-3}

Exponential growth occurs when values increase rapidly based on multiplication.

Example: A population doubles every year → If there are 1,000 people now, in 3 years: $1,000 \times 2^3 = 8,000$ people

Practice Problems

Solve the following:

1. Solve $x^2 + 7x + 10 = 0$ using factoring.
2. Simplify $(3^2 \times 3^3)$.
3. Write 0.00056 in scientific notation.
4. A city's population is 5,000 and grows by 4% per year. What will the population be in 2 years?
5. A ball is dropped from 100 meters and bounces half its previous height each time. How high is the bounce after 3 bounces?

GED/HiSET-Style Quiz

Multiple-Choice Questions

1. Solve $x^2 + 6x + 9 = 0$ a) $x = -1$ or $x = -9$ b) $x = -2$ or $x = -5$ c) $x = -3$ or $x = -3$ d) $x = -4$ or $x = -4$
2. Simplify $(5^3 \div 5^2)$ a) 5^5 b) 5^2 c) 5^1 d) 5^0
3. Convert 0.00024 into scientific notation. a) 2.4×10^4 b) 2.4×10^{-3} c) 2.4×10^{-4} d) 2.4×10^5
4. A virus spreads exponentially, doubling every hour. If there are 500 cases now, how many will there be in 3 hours? a) 2,000 b) 4,000 c) 6,000 d) 8,000
5. A stock increases by 5% per year starting at \$1,000. How much will it be worth in 2 years? a) \$1,050 b) \$1,100 c) \$1,102.50 d) \$1,200

Answer Key

1. c) $x = -3$ or $x = -3$
2. c) 5^1
3. c) 2.4×10^{-4}
4. b) 4,000
5. c) \$1,102.50

Chapter 10: Probability and Statistics

Concept Explanation

Probability and statistics help us analyze data, predict outcomes, and make informed decisions. These concepts are used in fields like science, business, economics, and medicine. This chapter covers **probability rules, statistical analysis, and making predictions based on data.**

Key Concepts

Probability Rules and Calculations Probability measures the likelihood of an event occurring. The formula for probability is: **Probability = (Number of favorable outcomes) ÷ (Total number of outcomes)**

- **Independent Events:** The outcome of one event does not affect the outcome of another. Example: flipping a coin twice.
- **Dependent Events:** The outcome of one event impacts the next event. Example: drawing two cards from a deck without replacing the first.
- **Mutually Exclusive Events:** Two events cannot happen at the same time. Example: rolling a 5 and a 6 on a single die.

Example Problem: A bag contains **6 red, 4 blue, and 2 yellow marbles**. What is the probability of randomly picking a blue marble? **Solution:** Total marbles = $6 + 4 + 2 = 12$ Blue marbles = 4 Probability = $4 \div 12 = 1/3$ or **33.3%**

Analyzing Statistical Data Statistics help us understand large sets of data by summarizing and interpreting numbers. Key terms include:

- **Mean (Average):** Add all values and divide by the total number of values.
- **Median (Middle Value):** Arrange values in order and find the middle number.
- **Mode (Most Frequent Number):** The number that appears the most.

Example Problem: Find the median of the following numbers: **12, 18, 24, 30, 36, 42, 48** **Solution:** Arrange the numbers in order → **12, 18, 24, 30, 36, 42, 48** The middle value is **30**, so the median is **30**.

Making Predictions Based on Data Probability and statistics are used to predict future outcomes.

- **Trend Analysis:** Identifying patterns to forecast future data.
- **Percentages and Likelihoods:** Calculating how likely an event is to occur.

Example Problem: A company sells an average of **200 products per day**. If this trend continues, how many products will they sell in **30 days**? **Solution:** $200 \times 30 = 6,000$ **products**. The company will likely sell **6,000 products** in a month.

Practice Problems

Solve the following:

1. A game spinner has 5 equal sections labeled A, B, C, D, and E. What is the probability of landing on A?
2. Find the mean of these test scores: 76, 89, 92, 85, 94.
3. A survey shows 30% of customers prefer Product X. If 500 customers are surveyed, how many prefer Product X?
4. A die is rolled 60 times, and a 6 appears 10 times. What percentage of the rolls resulted in a 6?
5. A town's population grows by 2% per year. If the current population is 25,000, what will it be in 3 years?

GED/HiSET-Style Quiz

Multiple-Choice Questions

1. A coin is flipped three times. What is the probability of getting three heads in a row? a) 12.5% b) 25% c) 50% d) 75%
2. A shoe store sells an average of 15 pairs per day. How many pairs will they sell in 2 weeks? a) 150 pairs b) 210 pairs c) 225 pairs d) 250 pairs
3. Find the mode of these numbers: 8, 12, 15, 12, 20, 25, 12 a) 8 b) 12 c) 15 d) 20
4. A business sees a 5% increase in revenue per year. If revenue is \$50,000 now, what will it be in 2 years? a) \$52,500 b) \$55,125 c) \$57,500 d) \$60,000
5. A student scores 72, 88, 95, 83, and 91 on tests. What is the median score? a) 83 b) 88 c) 91 d) 95

Answer Key

1. a) 12.5%
2. b) 210 pairs
3. b) 12
4. b) \$55,125
5. b) 88

Chapter 11: Multi-Step Problem Solving

Concept Explanation

Multi-step problem solving involves breaking down complex problems into smaller, manageable steps. This approach is essential for tackling word problems, critical thinking challenges, and real-world scenarios. Understanding how to structure solutions logically improves efficiency and accuracy. This chapter covers **how to approach multi-step equations, apply reasoning to word problems, and use mathematical strategies for exams.**

Key Concepts

Tackling Complex Multi-Step Equations A multi-step equation requires multiple operations to isolate the variable. The steps may include **adding, subtracting, multiplying, dividing, and distributing.**

Example Problem: Solve $2(3x - 4) + 5 = 23$ **Solution:**

1. Distribute: $6x - 8 + 5 = 23$
2. Combine like terms: $6x - 3 = 23$
3. Add 3 to both sides: $6x = 26$
4. Divide by 6: $x = 26 \div 6 = 4.33$

Applying Critical Thinking to Word Problems Word problems require identifying key information, setting up an equation, and solving it step by step.

Example Problem: A business spends \$500 on advertising and earns \$7 per product sold. If the total earnings were \$1,500, how many products were sold?
Solution:

1. Let x be the number of products sold: $7x - 500 = 1500$
2. Add 500 to both sides: $7x = 2000$
3. Divide by 7: $x = 285.71$ The business sold approximately **286 products.**

Using Mathematical Reasoning in Exams When solving multi-step problems on exams, follow these strategies:

- **Identify important numbers** in word problems.
- **Check the order of operations** (PEMDAS: Parentheses, Exponents, Multiplication/Division, Addition/Subtraction).

- **Verify the final answer** to ensure accuracy.

Example Problem: A machine produces **240 items per hour**. How many items will be made in **8 hours**, if **10% of them** are defective? **Solution:**

1. Find total items: $240 \times 8 = 1,920$
2. Find defective items: $10\% \text{ of } 1,920 = 192$
3. Find usable items: $1,920 - 192 = 1,728$ The machine produces **1,728 usable items**.

Practice Problems

Solve the following:

1. Solve $3(x - 2) + 8 = 29$.
2. A gym charges \$25 per month plus a \$50 sign-up fee. If a customer pays \$175, how many months did they use the gym?
3. A car rental costs \$30 per day plus a one-time fee of \$40. If the total cost was \$250, how many days was the car rented?
4. A package contains 150 pencils, and each student receives 7. How many students can receive pencils?
5. A store offers 20% off a \$120 item plus an extra \$5 discount. What is the final price?

GED/HiSET-Style Quiz

Multiple-Choice Questions

1. Solve $5(x - 3) + 12 = 37$ a) $x = 5$ b) $x = 6$ c) $x = 7$ d) $x = 8$
2. A factory produces 150 units per hour. How many are made in 10 hours, if 15% are defective? a) 1,125 units b) 1,275 units c) 1,325 units d) 1,350 units
3. A contractor charges \$250 for materials and \$60 per hour for labor. If the total bill is \$610, how many hours were worked? a) 5 hours b) 6 hours c) 7 hours d) 8 hours
4. A runner completes 5 miles per day. How many miles will they run in 6 weeks (assuming 7 days per week)? a) 210 miles b) 215 miles c) 220 miles d) 225 miles
5. A phone costs \$800, and a 15% discount applies. What is the final price? a) \$660 b) \$680 c) \$700 d) \$720

Answer Key

1. b) $x = 6$
2. b) 1,275 units
3. c) 7 hours
4. a) 210 miles
5. d) \$720

Chapter 12: GED/HiSET Test Strategies

Concept Explanation

Success on the GED and HiSET exams requires more than just knowing the material—it requires **effective test-taking strategies**. This chapter covers **understanding test question formats, managing time efficiently, and avoiding common mistakes** to improve performance on exam day.

Key Concepts

Understanding Test Question Formats GED and HiSET exams include multiple-choice, drag-and-drop, fill-in-the-blank, and extended response questions.

- **Multiple-choice** questions require selecting the best answer from four options.
- **Fill-in-the-blank** questions require direct answers without choices.
- **Drag-and-drop** questions involve organizing items correctly.
- **Extended response** sections, like essays, test writing and reasoning skills.

Example Problem: Which of the following is the square root of **64**? a) **6** b) **7** c) **8** d) **9**

Solution: The square root of **64** is **8**, so the correct answer is **c**).

Time Management Techniques Efficient use of time is crucial for completing the test successfully. Follow these strategies:

- **Skim through the test** before answering questions.
- **Answer easier questions first**, then return to harder ones.
- **Use process of elimination** for difficult multiple-choice questions.
- **Manage time effectively** for the essay section by outlining key points before writing.

Example Strategy: A math section has **30 questions** with a **90-minute** time limit. Spend **3 minutes per question** and leave **extra time at the end** for review.

Common Mistakes to Avoid Many test-takers lose points due to small errors. Avoid these mistakes:

- **Rushing through questions** without reading carefully.

- **Skipping instructions**, leading to incorrect responses.
- **Second-guessing correct answers** instead of trusting initial logic.
- **Not checking work**, which can lead to careless mistakes.

Example Mistake: A student miscalculates 12×4 and marks **44** instead of **48**.

Solution: Double-check calculations and use estimation when necessary.

Practice Problems

Solve the following:

1. A test has 50 questions with a 120-minute time limit. How many minutes should be spent per question?
2. What should you do if you're unsure of an answer on a multiple-choice question?
3. Why is it important to check your work before submitting the test?
4. A reading passage is 1,200 words long. How much time should be spent reading if you have 45 minutes total for the section?
5. If a math problem seems complicated, what strategy should you use to break it down?

GED/HiSET-Style Quiz

Multiple-Choice Questions

1. Which of the following is the best way to manage time during a test? a) Answer questions in order without skipping any b) Spend most of your time on the hardest questions first c) Skip harder questions and return to them later d) Wait until the last 10 minutes to answer math problems
2. If you don't know the answer to a multiple-choice question, what should you do? a) Guess randomly b) Eliminate answers that seem incorrect c) Skip the question completely d) Choose the answer with the longest explanation
3. Which is a common mistake test-takers make? a) Reading all instructions carefully b) Trusting their first answer choice c) Not checking their work before submitting d) Taking their time with difficult questions
4. If a math test has 40 questions and a 90-minute time limit, how much time should be spent per question? a) 1 minute b) 2 minutes c) 3 minutes d) 4 minutes

5. Which strategy improves essay writing on exams? a) Skipping the outline and writing immediately b) Reading the prompt carefully and outlining key points c) Using complicated words to impress the examiner d) Writing as quickly as possible without checking for mistakes

Answer Key

1. c) Skip harder questions and return to them later
2. b) Eliminate answers that seem incorrect
3. c) Not checking their work before submitting
4. b) 2 minutes
5. b) Reading the prompt carefully and outlining key points

Chapter 13: Full Practice Exams

Practice Time!

Preparing for the GED and HiSET exams requires more than just memorizing formulas—it demands strong problem-solving skills, time management, and familiarity with test structure.

The **GED math exam** is **115 minutes long** and includes multiple-choice, drag-and-drop, and fill-in-the-blank questions. It covers algebra, geometry, and data analysis, requiring test-takers to apply mathematical reasoning to real-world problems. Managing time effectively is crucial, as some questions require multi-step calculations. The **on-screen calculator** is available for certain sections, making it essential to practice calculator-based problem-solving.

The **HiSET math exam** is **90 minutes long** and consists entirely of multiple-choice questions. It focuses on algebra, geometry, statistics, and probability. Since the HiSET is shorter, test-takers must work efficiently, using estimation techniques and eliminating incorrect answers to maximize accuracy.

Both exams require strategic thinking, careful review, and confidence in applying math concepts under timed conditions. By practicing full-length exams, testers can refine their approach and improve their performance on test day.

GED Full-Length Practice Test (46 Questions)

Section 1: Algebra and Equations

1. Solve for x : $4x - 12 = 20$ a) $x = 2$ b) $x = 4$ c) $x = 6$ d) $x = 8$
2. Factor the expression: $x^2 + 7x + 12$ a) $(x + 3)(x + 4)$ b) $(x - 3)(x - 4)$ c) $(x + 6)(x + 2)$ d) $(x - 6)(x - 2)$
3. Solve the inequality: $3x + 5 \leq 20$ a) $x \leq 5$ b) $x \leq 7$ c) $x \leq 10$ d) $x \leq 15$
4. A company earns \$1,500 per month plus \$50 per customer. If they have 100 customers, what is their total earnings? a) \$5,500 b) \$6,500 c) \$7,500 d) \$8,500
5. Solve for x : $5x + 4 = 29$ a) $x = 4$ b) $x = 5$ c) $x = 6$ d) $x = 7$
6. Expand the expression: $(2x - 3)(x + 4)$ a) $2x^2 + 5x - 12$ b) $2x^2 + 8x - 12$ c) $2x^2 + 5x + 12$ d) $2x^2 + 8x + 12$
7. Solve: $9x - 3 = 2x + 18$ a) $x = 2$ b) $x = 3$ c) $x = 4$ d) $x = 5$
8. A train travels 60 miles per hour. How far will it travel in 5 hours? a) 250 miles b) 270 miles c) 300 miles d) 320 miles

Section 2: Geometry and Measurements

9. A triangle has sides 6 cm, 8 cm, and 10 cm. What is its perimeter? a) 20 cm b) 24 cm c) 26 cm d) 30 cm
10. A rectangular garden measures 15 ft $\times$ 9 ft. What is its area? a) 135 square feet b) 145 square feet c) 155 square feet d) 165 square feet
11. A cylinder has a radius of 4 cm and a height of 10 cm. What is its volume? Use $\pi \approx 3.14$ a) 502.4 cm³ b) 550.2 cm³ c) 600.8 cm³ d) 628.3 cm³
12. A square has a side length of 10 cm. What is its area? a) 50 cm² b) 75 cm² c) 100 cm² d) 150 cm²
13. A cone has a radius of 5 cm and a height of 12 cm. What is its volume? Use $\pi \approx 3.14$ a) 314 cm³ b) 314.6 cm³ c) 320 cm³ d) 325 cm³
14. A room measures 12 feet by 15 feet. What is its area? a) 160 square feet b) 170 square feet c) 180 square feet d) 190 square feet

Section 3: Data Analysis and Probability

15. A bag contains 5 red, 3 blue, and 2 green marbles. What is the probability of drawing a blue marble? a) 20% b) 25% c) 30% d) 35%
16. Find the mode of these numbers: 12, 18, 24, 18, 30, 42, 18 a) 12 b) 18 c) 24 d) 42
17. A survey shows 40% of people prefer Product A. If 500 people were surveyed, how many preferred Product A? a) 150 b) 200 c) 250 d) 300

18. A coin is flipped 3 times. What is the probability of getting all heads? a) 12.5% b) 25% c) 50% d) 75%
19. A store sells an average of 15 pairs of shoes per day. How many will they sell in 2 weeks? a) 150 pairs b) 210 pairs c) 225 pairs d) 250 pairs

Section 4: Applied Math Problems

20. A phone costs \$600 with a 10% discount and an additional \$25 off. What is the final price? a) \$505 b) \$525 c) \$535 d) \$545
21. A factory produces 1,200 units per day. How many will be made in 3 weeks (assuming a 5-day workweek)? a) 18,000 units b) 20,000 units c) 21,000 units d) 22,500 units
22. A runner completes 5 miles per day. How many miles will they run in 8 weeks, assuming 7 days per week? a) 270 miles b) 280 miles c) 285 miles d) 300 miles

Section 5: Exponents and Scientific Notation

23. Simplify $(3^2 \times 3^3)$ a) 3^6 b) 3^5 c) 3^4 d) 3^3
24. Convert 0.00042 to scientific notation a) 4.2×10^{-4} b) 4.2×10^{-3} c) 4.2×10^{-2} d) 4.2×10^2
25. A population doubles every year. If there are 1,000 people now, how many will there be in 3 years? a) 2,000 b) 4,000 c) 6,000 d) 8,000

Section 6: Word Problems & Applied Math

26. A business spends \$500 on advertising and earns \$8 per product sold. If total earnings were \$1,700, how many products were sold? a) 100 b) 150 c) 200 d) 250
27. A gym charges \$30 per month plus a \$50 sign-up fee. If a customer pays \$170, how many months did they use the gym? a) 4 months b) 5 months c) 6 months d) 7 months
28. A car rental costs \$35 per day plus a one-time fee of \$60. If the total cost was \$245, how many days was the car rented? a) 4 days b) 5 days c) 6 days d) 7 days
29. A savings account earns 4% annual interest on \$1,500. How much interest will it earn in 3 years? a) \$180 b) \$200 c) \$225 d) \$240
30. A package contains 180 pencils, and each student receives 9 pencils. How many students can receive pencils? a) 15 b) 18 c) 20 d) 25

Section 7: Graphs and Data Interpretation

31. A bar graph shows the number of books read by students in five months: 7, 11, 9, 13, and 10. Find the mean number of books read per month. a) 8 b) 9 c) 10 d) 11
32. A line graph tracks temperature over five days: Monday: 72°F, Tuesday: 78°F, Wednesday: 75°F, Thursday: 80°F, Friday: 76°F. What is the average temperature? a) 75°F b) 76°F c) 77°F d) 78°F
33. A survey asked 600 people about their favorite restaurant. If 250 chose Italian, what percentage preferred Italian food? a) 35% b) 40% c) 42% d) 45%

Section 8: Quadratic Equations

34. Solve $x^2 + 6x + 9 = 0$ a) $x = -3$ b) $x = -2$ c) $x = -1$ d) $x = 0$
35. Solve using the quadratic formula: $x^2 + 4x - 5 = 0$ a) $x = -5$ or $x = 1$ b) $x = -4$ or $x = 2$ c) $x = -3$ or $x = 1$ d) $x = -2$ or $x = 5$

Section 9: Probability & Statistics

36. A deck of cards has 52 cards. What is the probability of drawing a heart? a) 25% b) 30% c) 35% d) 40%
37. A store sells an average of 120 items per day. If sales increase by 8% per month, how many items will be sold in 2 months? a) 260 b) 270 c) 280 d) 290
38. Find the median of these scores: 75, 90, 85, 80, 95 a) 80 b) 85 c) 90 d) 95

Section 10: Multi-Step Problem Solving

39. Solve $2(4x - 3) + 7 = 21$ a) $x = 2$ b) $x = 3$ c) $x = 4$ d) $x = 5$
40. A factory produces 2,500 units per day. If production increases by 12% per month, how many units will be produced in 2 months? a) 5,600 b) 5,800 c) 6,000 d) 6,200
41. A test has 60 questions with a 120-minute time limit. How much time should be spent per question? a) 1 minute b) 2 minutes c) 3 minutes d) 4 minutes

Section 11: Real-World Applications

42. A store offers 25% off a \$200 item plus an extra \$15 discount. What is the final price? a) \$135 b) \$140 c) \$145 d) \$150
43. A contractor charges \$75 per hour plus a \$150 material fee. If the total bill is \$825, how many hours were worked? a) 7 hours b) 8 hours c) 9 hours d) 10 hours

44. A runner completes 6 miles per day. How many miles will they run in 5 weeks, assuming 6 days per week? a) 150 miles b) 160 miles c) 170 miles d) 180 miles
45. A business sees a 6% increase in revenue per year. If revenue is \$45,000 now, what will it be in 2 years? a) \$50,000 b) \$50,850 c) \$51,000 d) \$51,850
46. A phone costs \$900 with a 20% discount and an additional \$50 off. What is the final price? a) \$670 b) \$680 c) \$690 d) \$700

HiSET Full-Length Practice Test (46 Questions)

Section 1: Algebra and Equations

1. Solve for x : $3x + 7 = 25$ a) $x = 5$ b) $x = 6$ c) $x = 7$ d) $x = 8$
2. Factor the expression: $x^2 + 9x + 14$ a) $(x + 2)(x + 7)$ b) $(x + 3)(x + 6)$ c) $(x + 5)(x + 4)$ d) $(x + 7)(x + 2)$
3. Solve the inequality: $4x - 5 < 15$ a) $x < 4$ b) $x < 5$ c) $x > 5$ d) $x > 4$
4. Expand: $(2x - 3)(x + 5)$ a) $2x^2 + 7x - 15$ b) $2x^2 + 5x - 15$ c) $2x^2 + 7x + 15$ d) $2x^2 + 5x + 15$
5. A business earns \$1,800 per month plus \$60 per customer. If they have 90 customers, what is their total earnings? a) \$5,200 b) \$6,200 c) \$7,200 d) \$8,200
6. Solve for x : $7x + 5 = 47$ a) $x = 6$ b) $x = 7$ c) $x = 8$ d) $x = 9$
7. A train travels 65 miles per hour. How far will it travel in 7 hours? a) 425 miles b) 455 miles c) 475 miles d) 485 miles

Section 2: Geometry and Measurements

8. A triangle has sides 7 cm, 9 cm, and 12 cm. What is its perimeter? a) 24 cm b) 28 cm c) 30 cm d) 32 cm
9. A rectangular garden measures 18 ft $\times$ 10 ft. What is its area? a) 160 square feet b) 170 square feet c) 180 square feet d) 190 square feet
10. A cylinder has a radius of 5 cm and a height of 12 cm. What is its volume? Use $\pi \approx 3.14$ a) 942 cm³ b) 965 cm³ c) 978 cm³ d) 990 cm³
11. A cone has a radius of 6 cm and a height of 14 cm. What is its volume? Use $\pi \approx 3.14$ a) 527 cm³ b) 528 cm³ c) 529 cm³ d) 530 cm³
12. A square has a side length of 11 cm. What is its area? a) 121 cm² b) 132 cm² c) 143 cm² d) 154 cm²

Section 3: Data Analysis and Probability

13. A bag contains 8 red, 6 blue, and 4 green marbles. What is the probability of drawing a blue marble? a) 20% b) 25% c) 30% d) 35%
14. Find the mode of these numbers: 15, 20, 15, 25, 30, 15 a) 15 b) 20 c) 25 d) 30
15. A survey shows 45% of people prefer Product X. If 600 people were surveyed, how many preferred Product X? a) 250 b) 270 c) 275 d) 280
16. A coin is flipped 4 times. What is the probability of getting all heads? a) 6.25% b) 12.5% c) 25% d) 50%
17. A store sells an average of 18 pairs of shoes per day. How many will they sell in 2 weeks? a) 216 pairs b) 230 pairs c) 252 pairs d) 280 pairs

Section 4: Applied Math Problems

18. A phone costs \$750 with a 15% discount and an additional \$30 off. What is the final price? a) \$600 b) \$615 c) \$630 d) \$645
19. A factory produces 1,500 units per day. How many will be made in 4 weeks (assuming a 5-day workweek)? a) 30,000 units b) 32,000 units c) 34,000 units d) 36,000 units

20. A runner completes 6 miles per day. How many miles will they run in 7 weeks, assuming 7 days per week? a) 280 miles b) 294 miles c) 315 miles d) 330 miles

Section 5: Exponents and Scientific Notation

21. Simplify $(3^2 \times 3^3)$ a) 3^6 b) 3^5 c) 3^4 d) 3^3
22. Convert 0.00042 to scientific notation a) 4.2×10^{-4} b) 4.2×10^{-3} c) 4.2×10^{-2} d) 4.2×10^2
23. A population doubles every year. If there are 1,000 people now, how many will there be in 3 years? a) 2,000 b) 4,000 c) 6,000 d) 8,000

Section 6: Word Problems & Applied Math

24. A business spends \$500 on advertising and earns \$8 per product sold. If total earnings were \$1,700, how many products were sold? a) 100 b) 150 c) 200 d) 250
25. A gym charges \$30 per month plus a \$50 sign-up fee. If a customer pays \$170, how many months did they use the gym? a) 4 months b) 5 months c) 6 months d) 7 months
26. A car rental costs \$35 per day plus a one-time fee of \$60. If the total cost was \$245, how many days was the car rented? a) 4 days b) 5 days c) 6 days d) 7 days
27. A savings account earns 4% annual interest on \$1,500. How much interest will it earn in 3 years? a) \$180 b) \$200 c) \$225 d) \$240
28. A package contains 180 pencils, and each student receives 9 pencils. How many students can receive pencils? a) 15 b) 18 c) 20 d) 25

Section 7: Graphs and Data Interpretation

29. A bar graph shows the number of books read by students in five months: 7, 11, 9, 13, and 10. Find the mean number of books read per month. a) 8 b) 9 c) 10 d) 11
30. A line graph tracks temperature over five days: Monday: 72°F, Tuesday: 78°F, Wednesday: 75°F, Thursday: 80°F, Friday: 76°F. What is the average temperature? a) 75°F b) 76°F c) 77°F d) 78°F
31. A survey asked 600 people about their favorite restaurant. If 250 chose Italian, what percentage preferred Italian food? a) 35% b) 40% c) 42% d) 45%

Section 8: Quadratic Equations

32. Solve $x^2 + 6x + 9 = 0$ a) $x = -3$ b) $x = -2$ c) $x = -1$ d) $x = 0$
33. Solve using the quadratic formula: $x^2 + 4x - 5 = 0$ a) $x = -5$ or $x = 1$ b) $x = -4$ or $x = 2$ c) $x = -3$ or $x = 1$ d) $x = -2$ or $x = 5$

Section 9: Probability & Statistics

34. A deck of cards has 52 cards. What is the probability of drawing a heart? a) 25% b) 30% c) 35% d) 40%
35. A store sells an average of 120 items per day. If sales increase by 8% per month, how many items will be sold in 2 months? a) 260 b) 270 c) 280 d) 290
36. Find the median of these scores: 75, 90, 85, 80, 95 a) 80 b) 85 c) 90 d) 95

Section 10: Multi-Step Problem Solving

37. Solve $2(4x - 3) + 7 = 21$ a) $x = 2$ b) $x = 3$ c) $x = 4$ d) $x = 5$
38. A factory produces 2,500 units per day. If production increases by 12% per month, how many units will be produced in 2 months? a) 5,600 b) 5,800 c) 6,000 d) 6,200
39. A test has 60 questions with a 120-minute time limit. How much time should be spent per question? a) 1 minute b) 2 minutes c) 3 minutes d) 4 minutes

Section 11: Real-World Applications

40. A store offers 25% off a \$200 item plus an extra \$15 discount. What is the final price? a) \$135 b) \$140 c) \$145 d) \$150
41. A contractor charges \$75 per hour plus a \$150 material fee. If the total bill is \$825, how many hours were worked? a) 7 hours b) 8 hours c) 9 hours d) 10 hours
42. A runner completes 6 miles per day. How many miles will they run in 5 weeks, assuming 6 days per week? a) 150 miles b) 160 miles c) 170 miles d) 180 miles
43. A business sees a 6% increase in revenue per year. If revenue is \$45,000 now, what will it be in 2 years? a) \$50,000 b) \$50,850 c) \$51,000 d) \$51,850
44. A phone costs \$900 with a 20% discount and an additional \$50 off. What is the final price? a) \$670 b) \$680 c) \$690 d) \$700
45. A school tracks test scores for students. The scores are: 72, 88, 95, 83, 91. What is the median score? a) 83 b) 88 c) 91 d) 95
46. A savings account accrues compound interest at 5% annually. If \$2,000 is deposited, how much will it be worth in 3 years? a) \$2,315 b) \$2,450 c) \$2,550 d) \$2,650

47. A store offers a 30% discount on a \$250 item. What is the discounted price? a) \$150 b) \$160 c) \$175 d) \$180
48. A contractor charges \$50 per hour plus a \$200 equipment fee. If the total bill is \$700, how many hours were worked? a) 8 hours b) 9 hours c) 10 hours d) 11 hours
49. A runner completes 8 miles per day. How many miles will they run in 4 weeks, assuming 5 days per week? a) 120 miles b) 140 miles c) 150 miles d) 160 miles
50. A business sees a 10% increase in revenue per year. If revenue is \$60,000 now, what will it be in 3 years? a) \$72,000 b) \$79,860 c) \$80,000 d) \$81,600

Answer Key (GED Full-Length Test)

Section 1: Algebra and Equations

1. d) $x = 8$
2. a) $(x + 3)(x + 4)$
3. b) $x \leq 7$
4. c) \$7,500
5. d) $x = 7$
6. b) $2x^2 + 8x - 12$
7. c) $x = 4$
8. c) 300 miles

Section 2: Geometry and Measurements

9. b) 24 cm
- 10.a) 135 square feet
- 11.d) 628.3 cm^3
- 12.c) 100 cm^2
- 13.b) 314.6 cm^3
- 14.c) 180 square feet

Section 3: Data Analysis and Probability

- 15.c) 30%
- 16.b) 18
- 17.d) 300
- 18.a) 12.5%
- 19.b) 210 pairs

Section 4: Applied Math Problems

- 20.b) \$525
- 21.c) 21,000 units
- 22.d) 300 miles

Section 5: Exponents and Scientific Notation

- 23.b) 3^5
- 24.a) 4.2×10^{-4}
- 25.d) 8,000

Section 6: Word Problems & Applied Math

- 26.c) 200
- 27.a) 4 months
- 28.b) 5 days
- 29.c) \$225
- 30.b) 18 students

Section 7: Graphs and Data Interpretation

- 31.c) 10
- 32.b) 76°F
- 33.b) 40%

Section 8: Quadratic Equations

- 34.a) $x = -3$
- 35.a) $x = -5$ or $x = 1$

Section 9: Probability & Statistics

- 36.a) 25%
- 37.c) 280 items
- 38.b) 85

Section 10: Multi-Step Problem Solving

- 39.b) $x = 3$
- 40.d) 6,200 units
- 41.b) 2 minutes

Section 11: Real-World Applications

- 42.c) \$145
- 43.c) 9 hours
- 44.a) 150 miles
- 45.b) \$50,850
- 46.c) \$69

Answer Key (HiSET Full-Length Test)

Section 1: Algebra and Equations

1. b) $x = 6$
2. d) $(x + 7)(x + 2)$
3. b) $x < 5$
4. a) $2x^2 + 7x - 15$
5. c) \$7,200
6. b) $x = 7$
7. c) 475 miles

Section 2: Geometry and Measurements

8. c) 30 cm
9. c) 180 square feet
10. a) 942 cm^3
11. b) 528 cm^3
12. a) 121 cm^2

Section 3: Data Analysis and Probability

13. c) 30%
14. a) 15
15. b) 270
16. a) 6.25%
17. c) 252 pairs

Section 4: Applied Math Problems

18. c) \$630
19. a) 30,000 units
20. b) 294 miles

Section 5: Exponents and Scientific Notation

21. b) 3^5
22. a) 4.2×10^{-4}
23. d) 8,000

Section 6: Word Problems & Applied Math

24. c) 200
25. a) 4 months
26. b) 5 days
27. c) \$225

28. b) 18 students

Section 7: Graphs and Data Interpretation

29. c) 10

30. b) 76°F

31. b) 40%

Section 8: Quadratic Equations

32. a) $x = -3$

33. a) $x = -5$ or $x = 1$

Section 9: Probability & Statistics

34. a) 25%

35. c) 280 items

36. b) 85

Section 10: Multi-Step Problem Solving

37. b) $x = 3$

38. d) 6,200 units

39. b) 2 minutes

Section 11: Real-World Applications

40. c) \$145

41. c) 9 hours

42. a) 150 miles

43. b) \$50,850

44. c) \$690

45. b) 88

46. d) \$2,650

47. c) \$175

48. b) 9 hours

49. b) 140 miles

50. b) \$79,860