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Contents

Chapter 1 : Whole Numbers, Real Numbers, and Integers.....11

Rounding.....13
Estimates.....15
Whole Number Addition and Subtraction.....17
Whole Number Multiplication.....19
Whole Number Division.....21
Adding and Subtracting Integers.....23
Multiplying and Dividing Integers.....25
Arrange, Order, and Comparing Integers.....27
Compare Integer.....29
Order of Operations.....31
Integers and Absolute Value.....33

Chapter 2 : Fractions and Decimals.....35

Simplifying Fractions.....37
Factoring Numbers.....39
Greatest Common Factor (GCF).....41
Least Common Multiple (LCM).....43
Divisibility Rules.....45
Adding and Subtracting Fractions.....47
Multiplying and Dividing Fractions.....49
Adding Mixed Numbers.....51
Subtracting Mixed Numbers.....53
Multiplying Mixed Numbers.....55
Dividing Mixed Numbers.....57
Comparing Decimals.....59
Rounding Decimals.....61
Adding and Subtracting Decimals.....63
Multiplying Decimals.....65
Dividing Decimals.....67
Converting Between Fractions, Decimals and Mixed Numbers.....69

Chapter 3 : Proportion, Ratio, Percent.....71

Writing Ratios.....73
Simplifying Ratios.....75
Create a Proportion.....77
Similar Figures.....79
Ratio and Rates Word Problems.....81
Percentage Calculations.....83
Percent Problems.....85
Markup, Discount, and Tax.....87
Simple Interest.....89
Converting Between Percent, Fractions, and Decimals.....91

Chapter 4 : Exponents and Radicals.....93

Multiplication Property of Exponents.....95
Division Property of Exponents.....97
Powers of Products and Quotients.....99

Zero and Negative Exponents 101
Negative Exponents and Negative Bases 103
Writing Scientific Notation 105
Square Roots 107

Chapter 5 : Algebraic Expressions 109

Translate Phrases into an Algebraic Statement 111
The Distributive Property 113
Evaluating One Variable 115
Evaluating Two Variables 117
Expressions and Variables 119
Combining like Terms 121
Expressions 121
Simplifying Polynomial Expressions 123

Chapter 6 : Equations and Inequalities 125

One–Step Equations 127
Two–Step Equations 129
Multi–Step Equations 131
Graphing Single–Variable Inequalities 133
One–Step Inequalities 135
Two–Step Inequalities 137
Multi–Step Inequalities 139
Solving Systems of Equations by Substitution 141
Solving Systems of Equations by Elimination 143
Systems of Equations Word Problems 145
Linear Equations 147
Graphing Lines of Equations 149
Graphing Linear Inequalities 151
Finding Distance of Two Points 153

Chapter 7 : Polynomials 155

Classifying Polynomials 157
Adding and Subtracting Polynomials 159
Multiply and Divide Monomials 161
Multiplying Monomials 163
Multiply a Polynomial and a Monomial 165
Multiply Binomials 167
Factor Trinomials 169
Operations with Polynomials 171
Simplifying Polynomials 173

Chapter 8 : Functions 175

Relations and Functions 177
Rate of change 179
Slope 181
x and y intercept 183
Writing Linear Equations 185
Slope-intercept form 187
Point-slope form 189
Equation of Parallel or Perpendicular lines 191
Equation of Horizontal and Vertical Lines 193
Function Notation 195
Adding and Subtracting Functions 197

Multiplying and Dividing Functions 199
Composition of Functions 201
Solve a Quadratic Equation 203

Chapter 9 : Geometry 205

The Pythagorean Theorem 207
Angles 209
Area of Triangles 211
Area of Trapezoids 213
Area and Perimeter of Polygons 215
Area and Circumference of Circles 217
Volume of Cubes 219
Volume of Rectangle Prisms 221
Surface Area of Cubes 223
Surface Area of a Rectangle Prism 225
Volume of a Cylinder 227
Surface Area of a Cylinder 229

Chapter 10 : Statistics 231

Mean and Median 233
Mode and Range 235
Times Series 237
Box and Whisker Plot 239
Bar Graph 241
Dot plots 243
Scatter Plots 245
Stem–And–Leaf Plot 247
The Pie Graph or Circle Graph 249
Probability of Simple Events 251

Chapter 11 : TABE Test Review 253

TABE Mathematics Practice Tests Answer Sheet 255
Complete TABE Battery Math Practice Test 1 257
Part 1 – Mathematics Computation 258
Part 2 - Applied Mathematics 266
Complete TABE Battery Math Practice Test 2 277
Part 1 – Mathematics Computation 278
Part 2 - Applied Mathematics 286

Chapter 12 : Answers and Explanations 299

Answer Key 299
Practice Test 1 301
Part 1 - Mathematics Computation 301
Part 2 - Applied Mathematics 305
Practice Test 2 313
Part 1 - Mathematics Computation 313
Part 2 - Applied Mathematics 317

Chapter 1 : Whole Numbers, Real Numbers, and Integers

Topics that you'll learn in this chapter:

- Rounding and Estimates
- Addition, Subtraction, Multiplication and Division Whole Number and Integers
- Arrange and ordering Integers and Numbers
- Comparing Integers, Order of Operations
- Mixed Integer Computations
- Integers and Absolute Value

"If people do not believe that mathematics is simple, it is only because they do not realize how complicated life is." — John von Neumann

Name: .....

Rounding

Rounding is replacing a number up or down to the closest number or the closest hundred, etc.

- ✓ First, you have to know the place value you'll round to.
- ✓ Second, you have to find the digit to the right of the place value you're rounding to. If it is 5 or greater, add 1 to the place value you're rounding to and put zero for all digits on its right side. If the digit to the right of the place value is smaller than 5 then keep the place value and put zero for all digits to the right.

EXAMPLE:

Round 64 to the closest ten.

The place value of ten is 6. The digit on the right side is 4 (which is smaller than 5). Now keep 6 and put zero for the digit on the right side. Now our answer is 60. 64 is rounded to the closest ten is 60, because 64 is closer to 60 than to 70.

PRACTICES:

Round each number to the underlined place value.

1) $\underline{8}8$	2) $\underline{8}.15$
3) $\underline{4}{,}315$	4) $5\underline{6}5$
5) $1.\underline{3}31$	6) $14.\underline{2}3$
7) $\underline{2}.429$	8) $4.3\underline{1}3$
9) $2.\underline{9}97$	10) $\underline{7}.38$

Score: .....

Answer Key

1) 90	2) 8.0
3) 4,000	4) 570
5) 1.3	6) 14.2
7) 2.0	8) 4.31
9) 3.0	10) 7.0

Name: .....

Estimates

Estimating is a math policy used for approximating a number. To estimate *means* to make an irregular guess or calculation. To round means to make easier a known number by scaling it a little bit up or down.

- ✓ To estimate a math problem, round the numbers.
- ✓ For 2-digit numbers, you can usually round to the nearest tens, for 3-digit numbers, round to nearest hundreds, etc.
- ✓ Find the answer.

EXAMPLE:

Estimate the sum by rounding every number to the closest hundred. 153 + 426 =?

153 is rounded to the closest hundred which is 200. Now 426 is rounded to the closest hundred which is 400.

Then: 200 + 400 = 600

PRACTICES:

Estimate the sum by rounding each added to the nearest ten.

1) 17 + 18	2) 94 + 81
3) 203 + 56	4) 55 + 33
5) 96 + 49	6) 99 + 324
7) 823 + 488	8) 466 + 276
9) 5,112 + 5,792	10) 1,245 + 2,459

Score: .....

Answer Key

1) 40	2) 200
3) 260	4) 90
5) 150	6) 400
7) 1,300	8) 800
9) 11,000	10) 3,000

Name: .....

Whole Number Addition and Subtraction

- ✓ Arrange the numbers in line.
- ✓ Start with the unit place. (Ones place)
- ✓ Regroup if needed.
- ✓ Add or subtract the tens place.
- ✓ Continue with further digits.

EXAMPLE:

Find the sum. $\mathbf{285 + 145}$ =?

First line up the numbers: $\overset{285}{\underline{+\,145}}$ → Start with the unit place. (ones place) $5 + 5 = 10$,

Write 0 for ones place and keep 1, $\overset{\overset{1}{285}}{\underline{+\,145}\;\;0}$, Add the tens place and the digit 1 we kept:

$1 + 8 + 4 = 13$, Write 3 and keep 1, $\overset{\overset{1\;1}{285}}{\underline{+\,145}\;\;30}$

Continue with further digits → $1 + 2 + 1 = 4$ → $\overset{\overset{1\;1}{285}}{\underline{+\,145}\;\;430}$

Find the difference. $\mathbf{976 - 453}$ = ?

First line up the numbers: $\overset{976}{\underline{-\,453}}$, → Start with the unit place. $6 - 3 = 3$, $\overset{976}{\underline{-\,453}\;\;3}$,

Subtract the tens place. $7 - 5 = 2$, $\overset{976}{\underline{-\,453}\;\;23}$, Continue with further digits → $9 - 4 = 5$,

$\overset{976}{\underline{-\,453}\;\;523}$

PRACTICES:

Find the missing number.

1) 540 – ……..... = 100	2) 800 – ……. = 220
3) ……. – 2,650 = 6,700	4) 85,000 – 42,000 = ...
5) 1,280– ……..... = 420	6) 5,000 + 8,450 = ...
7) ……. – 3,870 = 9,630	8) 12,310 – ……. = 8,540

Solve.
9) A school had 708 students last year. If all last year students and 218 new students have registered for this year, how many students will there be in total?
10) Lisa had $856 dollars in her saving account. She gave $295 dollars to her brother, Tom. How much money does she have left?

Score: .....

Answer Key

1) 440	2) 580
3) 9,350	4) 43,000
5) 860	6) 13,450
7) 13,500	8) 3,770
9) 926	10) 561

Name: .....

Whole Number Multiplication

- ✓ First you have to learn the times tables! To solve multiplication problems quick, you need to learn the times table. For example, 3 times 8 is 24 or 8 times 7 is 56.
- ✓ For multiplication, line up the numbers that you are multiplying.
- ✓ Start with the ones place and regroup if needed.
- ✓ Continue with further digits.

EXAMPLE:

Solve. $\mathbf{500 \times 30} = ?$

Line up the numbers: $\frac{500}{\times\ 30}$, start with the ones place $\rightarrow 0 \times 500 = 0$, $\frac{500}{\times\ 30\ \ 0}$, Continue with further digit which is 3. $\rightarrow 3 \times 500 = 1{,}500$, $\frac{500}{\times\ 30\ \ 15{,}000}$

PRACTICES:

Multiply the Number.

1) $120 \times 6 =$ _____	2) $160 \times 30 =$ _____
3) $600 \times 30 =$ _____	4) $420 \times 20 =$ _____
5) $250 \times 40 =$ _____	6) $600 \times 40 =$ _____
7) $215 \times 70 =$ _____	8) $540 \times 11 =$ _____
9) $121 \times 10 =$ _____	10) $254 \times 16 =$ _____

Score: .....

Answer Key

1) 720	2) 4,800
3) 18,000	4) 8,400
5) 10,000	6) 24,000
7) 15,050	8) 5,940
9) 1,210	10) 4,064

Name: .....

Whole Number Division

- ✓ Division: A typical division problem: Dividend ÷ Divisor = Quotient
- ✓ In division, we want to find how many times a divisor is contained in a dividend. The result we obtain in a division problem is called quotient.
- ✓ First, the problem is written in division format. (Dividend is inside; divisor is outside)

Quotient

Divisor ⟌ Dividend

EXAMPLE:

Solve. **234 ÷ 4 = ?**

First, write the problem in division format. 4 ⟌ 234

Start from left digit of the dividend. 4 won't divide 2.

So, we have to choose another digit of the dividend. It is 3.

Now, we will find how many times 4 goes into 23 and the answer is 5.

Write 5 above the dividend part. 4 times 5 is 20.

Write 20 below 23 and subtract. We get the answer 3.

Now take down the next digit which is 4 and find how many times 4 goes into 34?

The answer is 8. Write 8 above dividend.

This is last step since there is no further digit left.

of the dividend to bring down.

The final answer is 58 and we have the remainder 2.

```
   5
4 ⟌234
```

```
   58
4 ⟌234
  -20
   34
  -32
    2
```

PRACTICES:

Divide the Number.

1) 450 ÷ 5 = _____	2) 320 ÷ 8 = _____
3) 125 ÷ 25 = _____	4) 720 ÷ 12 = _____
5) 588 ÷ 14 = _____	6) 299 ÷ 13 = _____
7) 869 ÷ 11 = _____	8) 801 ÷ 9 = _____
9) 493 ÷ 17 = _____	10) 600 ÷ 24 = _____

Score: .....

Answer Key

1) 90	2) 40
3) 5	4) 60
5) 42	6) 23
7) 79	8) 89
9) 29	10) 25

Name: .....

Adding and Subtracting Integers

- ✓ Integers include zero, positive natural numbers, and the negative of the natural numbers. {… , −3, −2, −1, 0, 1, 2, 3, …}
- ✓ Add a positive integer by putting it to the right on the number line.
- ✓ Add a negative integer by putting it to the left on the number line.
- ✓ Subtract an integer by adding its opposite.

EXAMPLE:

Solve. $(-8) - (-5) =$

We keep the first number and change the sign of the second number to its opposite.

(Change subtraction into addition. Then: $(-8) + 5 = -3$

Solve. $10 + (4 - 8) =$

First subtract the numbers in brackets, $4 - 8 = -4$

Then: $10 + (-4) =$ → changes addition into subtraction: $10 - 4 = 6$

PRACTICES:

Find the sum and difference.

1) $8 + (-11)$	2) $(-13) + 25$
3) $(55) - (21)$	4) $(4) - (-5) - (-3)$
5) $2 + (-11) + (-30) + (9)$	6) $(-5) + (-10) + (7 - 19)$
7) $(-20) - (-44)$	8) $(-9) - 13 + 20$
9) $(50) - (-5) + (-25)$	10) $24 + 16 + (-13)$

Score: .....

Answer Key

1) –3	2) 12
3) 34	4) 12
5) –30	6) –27
7) 24	8) –2
9) 30	10) 27

Name: .....

Multiplying and Dividing Integers

- ✓ (positive) × (positive) = positive
- ✓ (positive) ÷ (positive) = positive
- ✓ (negative) × (negative) = positive
- ✓ (negative) ÷ (negative) = positive
- ✓ (negative) × (positive) = negative
- ✓ (negative) ÷ (positive) = negative
- ✓ (positive) × (negative) = negative
- ✓ (positive) ÷ (negative) = negative

÷ / ×	+	-
+	+	-
-	-	+

EXAMPLE:

$(+5) \times (+3) = 5 + 5 + 5 = 15$

The basic idea of multiplication is recurrent addition. Example: 5 × 3 = 5 + 5 + 5 = 15

We know that division is the inverse operation of multiplication. So, 15÷3=5 because 5×3=15 In words, this expression says that 15 may be divided into 3 groups of 5 every because adding five thrice gives 15.

Divide (-91) by (-7)?

Examples on division of integers on different kinds of problems on integers are mentioned here step by step. (-91) ÷ (-7) =13

PRACTICES:

Find each product and each quotient.

1) (– 8) × (– 5)	2) 72 ÷ 9
3) 4 × (– 5) × (– 6)	4) (–95) ÷ (– 5)
5) 32 × (– 4)	6) (– 99) ÷ (– 11)
7) (– 12) × (– 4)	8) (– 123) ÷ 1
9) (– 4) × (– 3) × 5	10) (– 0) ÷ 15

Score: .....

Answer Key

1) 40	2) 8
3) 120	4) 19
5) –128	6) 9
7) 48	8) –123
9) 60	10) 0