

www.MathNotion.COM

... So Much More Online!

- ✓ FREE Math Lessons
 - ✓ More Math Learning Books!
 - ✓ Mathematics Worksheets
 - ✓ Online Math Tutors
- ✓ For a PDF Version of This Book



Please Visit www.mathnotion.com

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 : Measurement	109
Metric Length Measurement.....	111
Customary Length Measurement	113
Metric Capacity Measurement.....	115
Customary Capacity Measurement	117
Metric Weight and Mass Measurement.....	119
Customary Weight and Mass Measurement.....	121
Temperature	123
Chapter 6 : Algebraic Expressions	125
Translate Phrases into an Algebraic Statement.....	127
The Distributive Property	129
Evaluating One Variable	131
Evaluating Two Variables.....	133
Expressions and Variables	135
Combining like Terms	137
Expressions	137
Simplifying Polynomial Expressions	139
Chapter 7 : Equations and Inequalities.....	141
One-Step Equations	143
Two-Step Equations	145
Multi-Step Equations.....	147
Graphing Single-Variable Inequalities	149
One-Step Inequalities	151
Two-Step Inequalities	153
Multi-Step Inequalities	155
Solving Systems of Equations by Substitution.....	157
Solving Systems of Equations by Elimination	159
Systems of Equations Word Problems	161
Linear Equations	163
Graphing Lines of Equations.....	165
Graphing Linear Inequalities.....	167
Finding Distance of Two Points	169
Chapter 8 : Polynomials	171
Classifying Polynomials.....	173
Adding and Subtracting Polynomials.....	175
Multiply and Divide Monomials	177
Multiplying Monomials.....	179
Multiply a Polynomial and a Monomial.....	181
Multiply Binomials.....	183
Factor Trinomials	185
Operations with Polynomials.....	187
Simplifying Polynomials	189
Chapter 9 : Functions	191
Relations and Functions	193
Rate of change	195

CHSPE Math Prep

Slope	197
x and y intercept.....	199
Writing Linear Equations	201
Slope-intercept form	203
Point-slope form	205
Equation of Parallel or Perpendicular lines.....	207
Equation of Horizontal and Vertical Lines	209
Function Notation.....	211
Adding and Subtracting Functions.....	213
Multiplying and Dividing Functions	215
Composition of Functions	217
Solve a Quadratic Equation	219
Chapter 10 : Geometry.....	221
The Pythagorean Theorem.....	223
Angles	225
Area of Triangles.....	227
Area of Trapezoids	229
Area and Perimeter of Polygons.....	231
Area and Circumference of Circles	233
Volume of Cubes.....	235
Volume of Rectangle Prisms.....	237
Surface Area of Cubes.....	239
Surface Area of a Rectangle Prism.....	241
Volume of a Cylinder.....	243
Surface Area of a Cylinder.....	245
Chapter 11 : Statistics	247
Mean and Median	249
Mode and Range	251
Times Series	253
Box and Whisker Plot.....	255
Bar Graph	257
Dot plots.....	259
Scatter Plots	261
Stem-And-Leaf Plot	263
The Pie Graph or Circle Graph	265
Probability of Simple Events.....	267
Chapter 12 : CHSPE Test Review.....	269
CHSPE Test Mathematics Formula Sheet.....	271
CHSPE Practice Test 1	273
CHSPE Practice Test 2	285
Chapter 13 : Answers and Explanations.....	297
Answer Key.....	297
Practice Test 1	299
Practice Test 2	307

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) $8.\underline{1}5$
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. $285 + 145 = ?$

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

Write 0 for ones place and keep 1, $\begin{array}{r} 1 \\ 285 \\ +145 \\ \hline 0 \end{array}$, Add the tens place and the digit 1 we kept:

$1 + 8 + 4 = 13$, Write 3 and keep 1, $\begin{array}{r} 11 \\ 285 \\ +145 \\ \hline 30 \end{array}$

Continue with further digits → $1 + 2 + 1 = 4$ → $\begin{array}{r} 11 \\ 285 \\ +145 \\ \hline 430 \end{array}$

Find the difference. $976 - 453 = ?$

First line up the numbers: $\begin{array}{r} 976 \\ -453 \end{array}$, → Start with the unit place. $6 - 3 = 3$, $\begin{array}{r} 976 \\ -453 \\ \hline 3 \end{array}$,

Subtract the tens place. $7 - 5 = 2$, $\begin{array}{r} 976 \\ -453 \\ \hline 23 \end{array}$, Continue with further digits → $9 - 4 = 5$,

$$\begin{array}{r} 976 \\ -453 \\ \hline 523 \end{array}$$

PRACTICES:

Find the missing number.

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

CHSPE Math Prep

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. $500 \times 30 = ?$

Line up the numbers: $\begin{array}{r} 500 \\ \times 30 \\ \hline \end{array}$, start with the ones place $\rightarrow 0 \times 500 = 0$, $\begin{array}{r} 500 \\ \times 30 \\ 0 \end{array}$, Continue

with further digit which is 3. $\rightarrow 3 \times 500 = 1,500$, $\begin{array}{r} 500 \\ \times 30 \\ \hline 15,000 \end{array}$

PRACTICES:

Multiply the Number.

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

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)

$$\begin{array}{r} \text{Quotient} \\ \text{Divisor} \overline{) \text{Dividend}} \end{array}$$

EXAMPLE:

Solve. $234 \div 4 = ?$

First, write the problem in division format. $4 \overline{) 234}$

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.

$$\begin{array}{r} 5 \\ 4 \overline{) 234} \end{array}$$

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.

$$\begin{array}{r} 58 \\ 4 \overline{) 234} \\ \underline{-20} \\ 34 \\ \underline{-32} \\ 2 \end{array}$$

PRACTICES:

Divide the Number.

1) $450 \div 5 = \underline{\hspace{2cm}}$

2) $320 \div 8 = \underline{\hspace{2cm}}$

3) $125 \div 25 = \underline{\hspace{2cm}}$

4) $720 \div 12 = \underline{\hspace{2cm}}$

5) $588 \div 14 = \underline{\hspace{2cm}}$

6) $299 \div 13 = \underline{\hspace{2cm}}$

7) $869 \div 11 = \underline{\hspace{2cm}}$

8) $801 \div 9 = \underline{\hspace{2cm}}$

9) $493 \div 17 = \underline{\hspace{2cm}}$

10) $600 \div 24 = \underline{\hspace{2cm}}$

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: $5 \times 3 = 5 + 5 + 5 = 15$

We know that division is the inverse operation of multiplication. So, $15 \div 3 = 5$ because $5 \times 3 = 15$ 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. $(-91) \div (-7) = 13$

PRACTICES:

Find each product and each quotient.

1) $(-8) \times (-5)$	2) $72 \div 9$
3) $4 \times (-5) \times (-6)$	4) $(-95) \div (-5)$
5) $32 \times (-4)$	6) $(-99) \div (-11)$
7) $(-12) \times (-4)$	8) $(-123) \div 1$
9) $(-4) \times (-3) \times 5$	10) $(-0) \div 15$

Score:

Answer Key

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