

## What is different about this CST math study guide?

Dr. Clark applies her knowledge of math and test anxiety reduction to help students prepare for the CST.

Students project what their score might be by analyzing what they know. Math content is grouped by concepts in order to make the mathematics review easily manageable.

This further reduces the anxiety of students who struggle with math.

This book is ideal for students who experience high math anxiety as well as test anxiety. It is great for students who study independently as well as in a classroom tutoring environment.

Schools can use this book for short term intensive review courses, after school tutoring, or ongoing in class review.

The self-assessment that allows students to project how they might perform on the CST math test is a wonderfully helpful tool that parents can easily follow.

As a result, parents can better support their children to develop an effective and focused study plan.

# Contents

	<b>Page</b>
<b>Chapter 1</b>	
<i>Teacher Introduction - How to use the program</i>	1
<i>Student Introduction</i>	2
<i>Exam overview</i>	2
<i>Standards Blueprint</i>	3
<b>Chapter 2</b>	
<i>How to use the Self-Analysis and Scoring Guide</i>	9
<i>Self Analysis</i>	10
<i>How the Grade 7 CST math test is scored</i>	13
<b>Chapter 3 - Number Sense (NS)</b>	
<i>Introduction to Number Sense</i>	14
<i>Important Vocabulary</i>	16
<i>Strand Trace - Mental Math</i>	17
<i>Vocabulary Activity</i>	19
<i>Short Answer</i>	21
<i>Multiple Choice</i>	23
<i>Number Sense with Mathematical Reasoning (MR)</i>	24
<i>Common Misconceptions</i>	26
<b>Chapter 4 - Algebra and Functions (AF)</b>	
<i>Introduction to Algebra and Functions</i>	28
<i>Important Vocabulary</i>	30
<i>Strand Trace - Mental Math</i>	32
<i>Vocabulary Activity</i>	33
<i>Short Answer</i>	35
<i>Multiple Choice</i>	37
<i>Algebra and Functions with Mathematical Reasoning</i>	38
<i>Common Misconceptions</i>	40
<b>Chapter 5 - Measurement and Geometry (MG)</b>	
<i>Introduction to Measurement and Geometry</i>	42
<i>Important Vocabulary</i>	44
<i>Strand Trace - Mental Math</i>	46
<i>Vocabulary Activity</i>	48
<i>Short Answer</i>	50
<i>Multiple Choice</i>	52

# Contents

<i>Measurement and Geometry with Mathematical Reasoning (MR)</i>	53
<i>Common Misconceptions</i>	55
<b>Chapter 6 - Statistics, Data Analysis and Probability (PS)</b>	
<i>Introduction to Statistics, Data Analysis and Probability</i>	57
<i>Important Vocabulary</i>	58
<i>Strand Trace - Mental Math</i>	59
<i>Vocabulary Activity</i>	61
<i>Short Answer</i>	63
<i>Multiple Choice</i>	66
<i>Statistics, Data Analysis and Probability with Mathematical Reasoning</i>	68
<i>Common Misconceptions</i>	70
<b>Chapter 9</b>	
<i>Practice Test A</i>	72
<i>Practice Test A Answer Key</i>	87
<b>Chapter 10</b>	
<i>Practice Test B</i>	88
<i>Practice Test B Answer Key</i>	101
<b>Glossary</b>	102
<b>Important Web Sites</b>	110

## Grade 7 Mathematics - Number Sense

### NUMBER SENSE (NS)

22 problems on the CST

*Students will solve problems that involve discounts, markups, commissions, and profits; add, subtract, multiply, and divide rational integers, fractions, and terminating decimals and take positive rational numbers to whole-number powers; multiply, divide, and simplify rational numbers by using exponent rules; understand the meaning of and determine absolute value of number; convert fractions to decimals and percents and differentiate between rational and irrational numbers; compare rational numbers in scientific notation, calculate percent increase and decrease of a quantity; add and subtract fractions by using factoring to find common denominators.*

#### **5 items**

**NS 1.7** - Solve problems that involve discounts, markups, commissions, and profit and compute simple and compound interest.

#### **4 Items**

**NS 1.2** - Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals) and take positive rational numbers to whole-number powers.

#### **3 items**

**NS 2.3** - Multiply, divide, and simplify rational numbers by using exponent rules.

#### **2 items**

**NS 2.5** - Understand the meaning of the absolute value of a number; interpret the absolute value as the distance of the number from zero on a number line; and determine the absolute value of real numbers.

#### **1 item**

**NS 1.1** - Read, write, and compare rational numbers in scientific notation (positive and negative powers of 10) with approximate numbers using scientific notation.

**NS1.3** - Convert fractions to decimals and percents and use these representations in estimations, computations, and applications.

**NS1.4** - Differentiate between rational and irrational numbers.

## Grade 7 Mathematics - Number Sense

### Important Vocabulary

<b>Standard NS 1.1</b>	Rational numbers, positive and negative powers of 10, and scientific notation
<b>Standard NS 1.2</b>	Integers, fractions, terminating decimals, and whole-number powers
<b>Standard NS 1.3</b>	Fractions, decimals, percent, and estimation
<b>Standard NS 1.4</b>	Rational and Irrational numbers
<b>Standard NS 1.5</b>	Terminating decimal, repeating decimals, and reduced fraction
<b>Standard NS 1.6</b>	Percentage increase, percent decrease
<b>Standard NS 1.7</b>	Discounts, markups, commissions, profit, simple interests, compound interests
<b>Standard NS 2.1</b>	Negative whole-number exponents, expressions, exponents, common base
<b>Standard NS 2.2</b>	Factoring, common denominator
<b>Standard NS 2.3</b>	Simplify rational expressions, and exponent rules
<b>Standard NS 2.4</b>	Inverse relationships, raising to powers, extracting the root, perfect square, square root

## Grade 7 Mathematics - Number Sense

### Multiple Choice

1. Terry deposited \$300 at a local credit union at simple interest of 12% for one year. How much interest will he receive at the end of one year?

- a. \$36
- b. \$30
- c. \$12
- d. \$3.60

NS1.7 (5 Items)

4. To make smootie, Carol mixed  $\frac{1}{4}$  cup of strawberry purie,  $\frac{1}{3}$  cup of orange juice,  $\frac{1}{2}$  cup of apple juice, and  $1\frac{1}{4}$  cups of milk. What is the total quantity of all four mixtures?

- a. 2 cups
- b. 3 cups
- c.  $2\frac{1}{3}$  cups
- d.  $3\frac{1}{2}$  cups

NS1.2 (4 Items)

2. A video player that regularly sells for \$44 is on sale for 25% off. What is the sale price of the video player?

- a. \$40
- b. \$33
- c. \$11
- d. \$10

NS1.7 (5 Items)

5. What is  $\frac{2}{5} \times 0.32$ ?

- a. 12.8
- b. 1.28
- c. 0.128
- d. 0.12

NS1.2 (4 Items)

3. Janet works for a company where she is paid 10% commission on any sales she makes. In one month her sales total was \$3750. How much did Janet make in commission from her sales in one month?

- a. \$1375
- b. \$750
- c. \$375
- d. \$37.50

NS1.7 (5 Items)

6.  $\left(\frac{2}{5}\right)^3$

- a.  $\frac{6}{15}$
- b.  $\frac{8}{25}$
- c.  $\frac{4}{25}$
- d.  $\frac{8}{125}$

NS1.2 (4 Items)

## Grade 7 Mathematics - Number Sense

### Common Misconceptions

#### ***Misconception #1 - Discount of a discount***

Some students will perhaps incorrectly think that since there was a  $n\%$  discount and a  $k\%$  discount that made a total discount of  $(n+k)\%$ . By adding the two discounts, their answers will be wrong.

To correct this misconception, you could give them a scenario where the first discount is 40% and the second discount is 60%. If they decide to add the two discounts, they will end with 100% discount, which does not make sense. Stating that the discount is 100% would mean that the discount was the price of the item, which would make the item free. Therefore the students should understand that they have to find the discount of the number first using the first discount and then find the discount of this resulting number using the second discount.

## Practice Test A

55. Which of the following represents an inequality?

- A.  $2x + 3 = 5$   
 B.  $3 + 2x$   
 C.  $2x + 3 < 5$   
 D.  $\frac{2}{3}x = 5$

58. Which expression has the same value as  $y^5$ ?

- A.  $5y$   
 B.  $\frac{5}{y}$   
 C.  $y \cdot y \cdot y \cdot y \cdot y$   
 D.  $5y \cdot 5y \cdot 5y \cdot 5y \cdot 5y$

56. Simplify  $4^{-7} \cdot x^{-3}$

- A.  $\frac{1}{4^7 x^3}$   
 B.  $\frac{4^7}{x^3}$   
 C.  $28x^3$   
 D.  $\frac{28}{x^3}$

59. Simplify the following monomial  $\frac{x^3}{x^6}$

- A.  $\frac{1}{x^2}$   
 B.  $\frac{1}{x^3}$   
 C.  $\frac{x}{x^3}$   
 D.  $\frac{x}{x^2}$

57. The table shown below represents the time required to fill a tank with water

Time (hr)	0	1	2	3	4	5
Quantity of water (gallons)	100	200	300	400	500	600

Which graph best represent this situation?

A

B

C

