g Chapter 5
of
FRACTIONS, DECIMALS, & PERCENTS

STRATEGIES FOR
DATA SUFFICIENCY

In This Chapter . . .

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Rephrasing: One Equation, One Variable

Data sufficiency problems that deal with FDP's usually present various parts and wholes. Keeping track of them can be difficult. Therefore, one strategy to help you solve these problems is to REPHRASE questions and statements into equations in order to keep track of what you know and what you need to know. Your ultimate goal in writing equations is to combine them in such a way that you are left with a single equation with only one variable. The variable in the equation should represent the quantity you are asked to find in the original question.

> **If a brokerage firm charged a commission of 2% of the total dollar amount of a certain trade, what was the total dollar amount of that trade?**
>
> **(1) The dollar amount of the trade minus the brokerage firm's commission was $88,000.**
> **(2) The brokerage firm's commission decreased the profit earned on the trade by 20%.**

A   Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
B   Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
C   BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
D   EACH statement ALONE is sufficient.
E   Statements (1) and (2) together are NOT sufficient.

First, assign a variable to represent the unknown for which you are trying to solve:

> Let d = the total dollar amount of the trade

Then, express the information given in the question, identifying any other variables you need:

> Let c = the brokerage firm's commission
>
> $c = .02d$

Test each statement, writing equations to represent the information. If the information in the statement can be combined with the information in the question to yield a single equation with the single variable d, the statement is sufficient:

Statement (1): $d - c = 88,000$

> Substitute the value for c given in the question.
>
> $d - (.02d) = 88,000$

This is a single equation with a single variable so it is sufficient to solve for d and answer the question.

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Statement (2) introduces a new variable into the picture: profit.

Let p = the profit before the commission

$$p - c = 0.80p$$

Since we do not know p, the amount of profit from the trade before the commission, we cannot solve for c, the brokerage firm's commission.

Since we cannot find c, we are unable to determine d, the total dollar amount of the trade. Thus, statement (2) is NOT sufficient.

The answer to this data sufficiency problem is (A): Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.

Beware of statements that introduce too many variables. These are usually not sufficient to answer the question.

Rephrasing: Challenge Short Set

At the very end of this book, you will find lists of FRACTIONS, DECIMALS, & PERCENTS problems that have appeared on past official GMAT exams. These lists reference problems from *The Official Guide for GMAT Review, 11th Edition* and *The Official Guide for GMAT Quantitative Review* (the questions contained therein are the property of The Graduate Management Admission Council, which is not affiliated in any way with Manhattan GMAT).

As you work through the Data Sufficiency problems listed at the end of this book, be sure to focus on *rephrasing.* If possible, try to *rephrase* each question into its simplest form *before* looking at the two statements. In order to rephrase, focus on figuring out the specific information that is absolutely necessary to answer the question. After rephrasing the question, you should also try to *rephrase* each of the two statements, if possible. Rephrase each statement by simplifying the given information into its most basic form.

In order to help you practice rephrasing, we have taken the most difficult Data Sufficiency problems on *The Official Guide* problem list (these are the problem numbers listed in the "Challenge Short Set" on page 81) and have provided you with our own sample rephrasings for each question and statement. In order to evaluate how effectively you are using the rephrasing strategy, you can compare your rephrased questions and statements to our own rephrasings that appear below. Questions and statements that are significantly rephrased appear in **bold**.

Rephrasings from *The Official Guide For GMAT Review, 11th Edition*

The questions and statements that appear below are only our *rephrasings*. The original questions and statements can be found by referencing the problem numbers below in the Data Sufficiency section of *The Official Guide for GMAT Review, 11th edition* (pages 278-290).

55. Let d = the number of guests served a double scoop
    Let s = the number of guests served a single scoop

    What is the value of d?

    (1) $.6(d + s) = d$

    (2) $2d + s = 120$

110. Let t = the tens digit of the bill
     Let u = the units digit of the bill
     $10t + u$ = the amount of the bill
     $2t$ = the amount of the tip

     Is $2t > .15(10t + u)$?
     Is $2t > 1.5t + .15u$?

     Is $\dfrac{10t}{3} > u$?

     (1) $1 \leq t \leq 4$

     (2) $2t = 8$
          $t = 4$

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111.   Let x = the original price of stock X

Let y = the original price of stock Y

What is the value of $\dfrac{.9y}{x}$?

What is the value of $\dfrac{y}{x}$?

(1) $1.1x = y$

$\dfrac{y}{x} = 1.1$

(2) $.1x = (\dfrac{10}{11}).1y$

$\dfrac{y}{x} = \dfrac{11}{10}$

150.   Let a = the regular price of the most expensive item

Let b = the regular price of the second most expensive item

Let c = the regular price of the least expensive item

Is $.2a + .1b + .1c > .15(a + b + c)$?

         Is $.05a > .05b + .05c$?

Is $a > b + c$?

(1) $a = 50, \; b = 20, \; c < 20$

(2) $c = 15, \; b > 15, \; a > 15$

Rephrasings from *The Official Guide for GMAT Quantitative Review*

The questions and statements that appear below are only our *rephrasings*. The original questions and statements can be found by referencing the problem numbers below in the Data Sufficiency section of *The Official Guide for GMAT Quantitative Review* (pages 149-157).

5. Let x = the percent discount at which the TV was bought
    Let y = the percent mark-up at which the TV was sold
    Let z = the original (list) price

    Purchase Price = $z \times \dfrac{(100 - x)}{100}$ and Sale Price = $z \times \dfrac{(100 - y)}{100}$

    What is the value of z?

    (1) $x = 15$

    (2) $y = x - 5$

22. Let s = money awarded to the spouse
    Let a = money awarded to the oldest child
    Let b = money awarded to the middle child
    Let c = money awarded to the youngest child
    $s + a + b + c = 200,000$
    $c = 200,000 - (a + b + s)$

    What is the value of c?

    (1) $s = 100,000$
       $a = 25,000$

    (2) $b = c$
       $a = c - 12,500$
       $s = c + 62,500$

48. The easiest way to solve this problem is to test numbers, making sure to test both integer and decimal values for r and s.

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49.   Let n = the number of shares

     What is the value of $\dfrac{12,000}{n}$?

     What is the value of n?

     (1) $n(\dfrac{12,000}{n} + 1) = \$12,300$

         $12000 + n = \$12,300$
            $n = 300$

     (2) $n(\dfrac{12,000}{n} - 2) = .95(\$12,300)$

         $12,000 - 2n = 11,400$
            $2n = 600$
            $n = 300$

72.   Let r = the number of games remaining for Team A
     Let t = total number of games played by Team A = $20 + r$
     Let w = games won by Team A = $10 + r$

     What is the value of w?
     Better: What is the value of r?

     (1) $t = 25$
     (2) $\dfrac{w}{t} = \dfrac{10 + r}{20 + r} = .60$

         $10 + r = 12 + .6r$
           $.4r = 2$
            $r = 5$

113.   The easiest way to solve this problem is to test numbers.
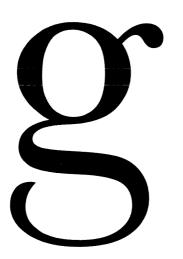
g Chapter 6
of
FRACTIONS, DECIMALS, & PERCENTS

OFFICIAL GUIDE
PROBLEM SETS

In This Chapter . . .

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- Fractions, Decimals, & Percents Problem Solving List from *The Official Guides*
- Fractions, Decimals, & Percents Data Sufficiency List from *The Official Guides*

Practicing with REAL GMAT Problems

Now that you have completed your study of FRACTIONS, DECIMALS, & PERCENTS, it is time to test your skills on problems that have actually appeared on real GMAT exams over the past several years.

The problem sets that follow are composed of questions from two books published by the Graduate Management Admission Council® (the organization that develops the official GMAT exam):

The Official Guide for GMAT Review, 11th Edition &
The Official Guide for GMAT Quantitative Review

These two books contain quantitative questions that have appeared on past official GMAT exams. (The questions contained therein are the property of The Graduate Management Admission Council, which is not affiliated in any way with Manhattan GMAT.)

Although the questions in the Official Guides have been "retired" (they will not appear on future official GMAT exams), they are great practice questions.

In order to help you practice effectively, we have categorized every problem in The Official Guides by topic and subtopic. On the following pages, you will find two categorized lists:

(1) **Problem Solving:** Lists all Problem Solving FRACTION, DECIMAL, & PERCENT questions contained in *The Official Guides* and categorizes them by subtopic.

(2) **Data Sufficiency:** Lists all Data Sufficiency FRACTION, DECIMAL, & PERCENT questions contained in *The Official Guides* and categorizes them by subtopic.

Note: Each book in Manhattan GMAT's 7-book preparation series contains its own *Official Guide* lists that pertain to the specific topic of that particular book. If you complete all the practice problems contained on the *Official Guide* lists in the back of each of the 7 Manhattan GMAT preparation books, you will have completed every single question published in *The Official Guides*. At that point, you should be ready to take your Official GMAT exam!

Problem Solving

from *The Official Guide for GMAT Review, 11th edition* (pages 20-23 & 152-186) and *The Official Guide for GMAT Quantitative Review* (pages 62-85)

Note: Problem numbers preceded by "D" refer to questions in the Diagnostic Test chapter of *The Official Guide for GMAT Review, 11th edition* (pages 20-23).

Solve each of the following problems in a notebook, making sure to demonstrate how you arrived at each answer by showing all of your work and computations. If you get stuck on a problem, look back at the FDP strategies and content in this guide to assist you.

CHALLENGE SHORT SET
This set contains the more difficult FDP problems from each of the content areas.
> *11th edition*: D11, D12, 115, 138, 142, 156, 165, 175, 177, 228, 237, 240
> *Quantitative Review*: 33, 37, 41, 73, 79, 100, 101, 120, 134, 142, 143, 159, 165, 167

FULL PROBLEM SET
Fractions
> *11th edition*: D8, 14, 40, 42, 77, 84, 96, 109, 117, 138, 162, 174, 175, 183, 188, 198,
>> 221, 243
> *Quantitative Review*: 5, 11, 37, 39, 44, 46, 48, 51, 57, 61, 73, 79, 88, 108, 112, 134, 135,
>> 154, 162, 165, 167, 176

Digits and Decimals
> *11th edition*: D1, D11, 12, 66, 113, 129, 133, 143, 184, 194, 219, 228, 244
> *Quantitative Review*: 2, 4, 41, 65, 66, 93, 142, 174

Percents
> *11th edition*: D21, 6, 17, 34, 44, 48, 59, 75, 78, 100, 104, 123, 128, 131, 139, 156, 165,
>> 197, 240
> *Quantitative Review*: 8, 10, 13, 24, 33, 47, 74, 95, 101, 114, 120, 138, 143, 156, 158,
>> 159

Successive Percents and Percent Change
> *11th edition*: D12, 15, 62, 80, 94, 110, 115, 151, 177, 237
> *Quantitative Review*: 6, 36, 40, 67, 89, 100

FDP's
> *11th edition*: 8, 22, 53, 83, 142, 189
> *Quantitative Review*: 25, 27, 43, 56

Data Sufficiency

from *The Official Guide for GMAT Review, 11th edition* (pages 24-25 & 278-290) and *The Official Guide for GMAT Quantitative Review* (pages 149-157)

Note: Problem numbers preceded by "D" refer to questions in the Diagnostic Test chapter of *The Official Guide for GMAT Review, 11th edition* (pages 24-25).

Solve each of the following problems in a notebook, making sure to demonstrate how you arrived at each answer by showing all of your work and computations. If you get stuck on a problem, look back at the FDP strategies and content contained in this guide to assist you.

Practice REPHRASING both the questions and the statements by using variables and construct-ing equations. The majority of data sufficiency problems can be rephrased; however, if you have difficulty rephrasing a problem, try testing numbers to solve it.

It is especially important that you familiarize yourself with the directions for data sufficiency problems, and that you memorize the 5 fixed answer choices that accompany all data sufficien-cy problems.

CHALLENGE SHORT SET
This set contains the more difficult FDP problems from each of the content areas.
> *11th edition*: 55, 110, 111, 150
> *Quantitative Review*: 5, 22, 48, 49, 72, 113

FULL PROBLEM SET
Fractions
> *11th edition*: 31, 84,
> *Quantitative Review*: 2, 22, 113

Digits and Decimals
> *11th edition*: D25, 16, 35, 45, 58
> *Quantitative Review*: 30, 44, 48

Percents
> *11th edition*: D40, 1, 7, 55, 59, 74, 77, 150
> *Quantitative Review*: 5, 36, 49, 52, 72, 89

Successive Percents and Percent Change
> *11th edition*: 91
> *Quantitative Review*: 1

FDP's
> *11th edition*: 4, 8, 34, 46, 62, 69, 107, 110, 111

Chapter By Chapter:

Manhattan GMAT* Prep

1. **DIGITS & DECIMALS:**
   Place Value, Estimation, Powers of 10, Last Digit Shortcut, Heavy

2. **FRACTIONS:**
   Simplifying, Multiplication Shortcut, Reciprocals, Cross-Multiplication, Splitting, Benchmark Values, Smart Numbers

3. **PERCENTS:**
   Percent Tables, Percentage Change, Successive Percents, Percent Formulas, Percent Mixtures

4. **FDP's:**
   FDP Connection, Conversions, Common Equivalents

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About The Authors:

Manhattan GMAT's 7 preparation guides were developed by its talented staff of real teachers, all of whom have scored in the 99th percentile on the official GMAT. As the company focuses solely on the GMAT (no other tests), it continually updates the guides to reflect the GMAT's most current trends. Questions are refined and strategies enhanced, blending the academic and test-taking skills that have been essential to the success of Manhattan GMAT students around the world.

The nation's largest GMAT-exclusive preparation provider, Manhattan GMAT was founded by Zeke Vanderhoek. A Yale graduate, Zeke taught as a member of Teach for America at a New York City public junior-high school, earned a Masters in Philosophy & Education from Columbia University's Teachers College, and supplemented his day-job by tutoring individuals in various subjects at all educational levels. Word-of-mouth referrals soon brought in a remarkably high number of GMAT test-takers, and thus Manhattan GMAT and its prep guides were born.
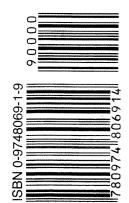
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