Placement Test E
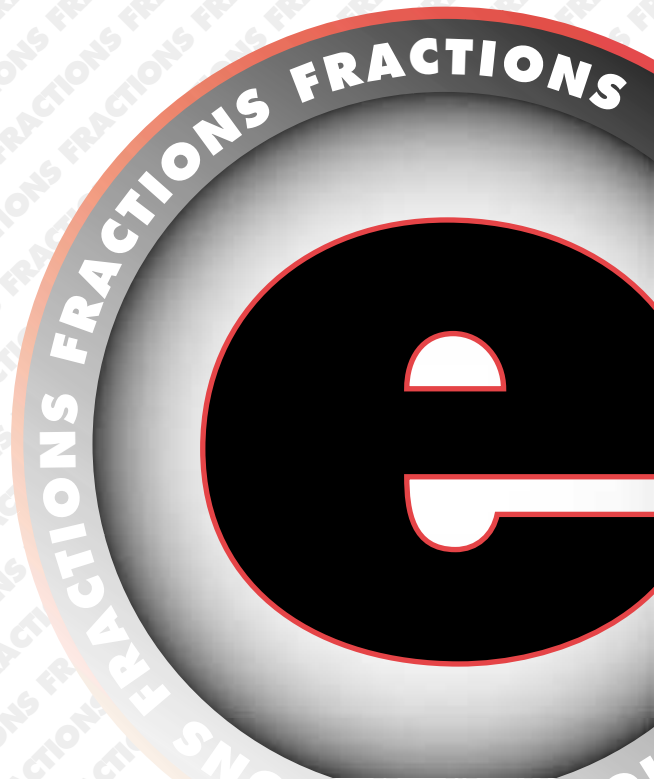
COMPUTATIONS

FRACTIONS

Developmental Mathematics

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How to Use the Placement Test

The Placement Test pamphlet is composed of three parts; the student's Placement Test, the educator's Placement Guidelines, and the Placement Key. The educator's Placement Guidelines and the Placement Key are contained on the inside of the front cover and the inside of the back cover of the pamphlet, respectively. The student's Placement Test is enclosed as the eight-page contents of the pamphlet. Please remove the cover of the Placement Test pamphlet for the educator, so the student does not have access to the Placement Key. Give the eight-page Placement Test to the student for completion, and use the following Placement Guidelines and Placement Key to check his or her work. It's as easy as 1, 2, 3!

Placement Guidelines

Placement Test E covers the theoretical concepts, basic facts, and practical skills in *Developmental Mathematics* Levels 14, 15, and 16. The specific Placement Test questions that address these levels are as follows:

Level 14 **Fractions:** Concepts and Basic Skills
Questions 1–20
Level 15 **Fractions:** Advanced Skills
Questions 21–34
Level 16 **Special Topics:** Ratio, Percent, Graphs and More
Questions 35–59

The student should attempt to complete the entire Placement Test until he or she cannot proceed without aid. After the student completes the questions, the educator should analyze the responses that address a specific level, item by item, and evaluate the quality of the student's performance. Typical results show a decrease in the quality of the student's performance in the more complicated concepts tested toward the end of the Placement Test. If *most* of the answers given are correct, then the student has successfully passed the current level of the Placement Test. However, if *most* of the answers are incorrect or if the student is hesitant in giving his or her answers, then the student is in need of practice, and he or she should begin the *Developmental Mathematics* curriculum with the current level. Good luck!

## Mathematics Placement and Scoring System *(MPASS)*

Mathematics Programs Associates (MPA) has developed an automated computerized version of the *Developmental Mathematics* placement and scoring framework, available on disk and on the World Wide Web. Visit our Internet distributor at www.greatpyramid.com and find the placement *(MPASS)* mechanism within the mathematics section of the product module. You can also learn more about MPA and *Developmental Mathematics*.
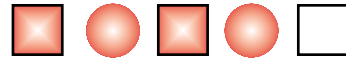
PLACEMENT TEST E
Computations: Fractions

Name:_____ Date:_____

1. Which of the following figures has one–third colored (A or B)?

   A ▭

   B ▭
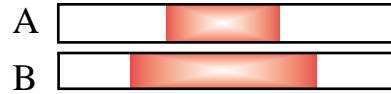
2. In the set of figures:

   What fraction of the set is colored? _____

   What fraction of the set is blank? _____

3. The figure to the right is divided into fifths.

   The whole figure represents 60 stamps.

   How many stamps does the colored area represent? _____

4. Mark had $90.

   He spent $\frac{1}{6}$ of his money.

   How many dollars did he spend? _____

5. The figure is divided into fourths.

   The whole figure represents 40 marbles.

   How many marbles does the colored

   area represent? _____

6. Mr. Smith, the grocer, had 684 eggs.

   He sold $\frac{3}{4}$ of his eggs.

   How many eggs did he sell? _____

7. The figure is divided into thirds.

   The colored area represents 30 fish.

   How many fish does the whole figure represent? _____

8. Dick has 12 blue marbles.

   These are $\frac{1}{5}$ of all his marbles.

   In all, how many marbles does he have? _____

9. The figure is divided into sevenths. The colored area represents 30 books. How many books does the whole figure represent?

_____

10. Sue sold 24 stamps. These were $\frac{3}{8}$ of all the stamps she had. In all, how many stamps did she have?

_____

---

11. Write the missing number.

a. $1 = \dfrac{}{4}$

b. $2 = \dfrac{}{3}$

c. $8 = \dfrac{}{5}$

d. $2\,\dfrac{1}{3} = \dfrac{}{3}$

e. $3\,\dfrac{2}{7} = \dfrac{}{7}$

f. $4\,\dfrac{9}{10} = \dfrac{}{10}$

---

12. Write as a mixed number.

a. $\dfrac{8}{5} = \text{—}$

b. $\dfrac{9}{4} = \text{—}$

c. $\dfrac{37}{10} = \text{—}$

---

13. Write as an improper fraction.

a. $3\,\dfrac{1}{2} = \text{—}$

b. $6\,\dfrac{2}{5} = \text{—}$

c. $9\,\dfrac{7}{10} = \text{—}$

---

14. Add.

a. $\dfrac{2}{5} + \dfrac{1}{5} =$

b. $\dfrac{3}{7} + \dfrac{2}{7} =$

c. $\dfrac{1}{9} + \dfrac{4}{9} =$

---

15. Add.

a. $\dfrac{2}{7}$
   $+ \dfrac{6}{7}$
   _____

b. $\dfrac{4}{9}$
   $+ \dfrac{7}{9}$
   _____

c. $2\,\dfrac{3}{5}$
   $+ 4\,\dfrac{2}{5}$
   _____

d. $1\,\dfrac{3}{8}$
   $+ 2\,\dfrac{5}{8}$
   _____

e. $2\,\dfrac{2}{5}$
   $+ 4\,\dfrac{3}{5}$
   _____

f. $3\,\dfrac{1}{7}$
   $3\,\dfrac{2}{7}$
   $+ 2\,\dfrac{4}{7}$
   _____

g. $\dfrac{2}{3}$
   $2\,\dfrac{1}{3}$
   $+ 5\,\dfrac{2}{3}$
   _____

16. Subtract.

a. $\dfrac{5}{7} - \dfrac{2}{7} =$ ____

b. $\dfrac{5}{7} - \dfrac{3}{7} =$ ____

c. $1 - \dfrac{1}{3} =$ ____

d. $2 - \dfrac{3}{5} =$ ____

e. $9\dfrac{5}{6} - \dfrac{1}{6} =$ ____

f. $6\dfrac{2}{5} - 3\dfrac{1}{5} =$ ____

17. Subtract.

a. $8\dfrac{1}{3} - \dfrac{2}{3} =$ ____

b. $6\dfrac{1}{7} - 2\dfrac{4}{7} =$ ____

c. $4\dfrac{2}{5} - 3\dfrac{4}{5} =$ ____

d. $7\dfrac{1}{4} = 6\dfrac{5}{4}$

$\quad -\dfrac{3}{4} = \quad \dfrac{3}{4}$

e. $\quad 5\dfrac{3}{8} = 4\dfrac{11}{8}$

$\quad -2\dfrac{7}{8} = 2\dfrac{7}{8}$

18. Multiply.

a. $2 \times \dfrac{3}{7} =$ ____

b. $4 \times \dfrac{2}{5} =$ ____

c. $3 \times 2\dfrac{1}{2} =$ ____

d. $7 \times 6\dfrac{3}{4} =$ ____

19. Divide.

a. $5 \div \dfrac{1}{2} =$ ____

b. $6 \div \dfrac{1}{3} =$ ____

c. $6 \div \dfrac{3}{4} =$ ____

d. $5 \div \dfrac{2}{3} =$ ____

20. Divide.

a. $\dfrac{1}{3} \div 2 =$ ____

b. $\dfrac{1}{4} \div 7 =$ ____

c. $\div$ = ____

d. $\div$ = ____

e. $8 \div 2 =$ ____

f. $9 \div 1 =$ ____

21. Write the missing number.

a. $\dfrac{1}{2} = \dfrac{}{8}$ b. $\dfrac{5}{6} = \dfrac{}{30}$ c. $\dfrac{2}{3} = \dfrac{}{9}$

d. $\dfrac{4}{8} = \dfrac{1}{}$ e. $\dfrac{12}{15} = \dfrac{4}{}$ f. $\dfrac{9}{18} = \dfrac{4}{}$

22. Add.

a. $\dfrac{1}{2} + \dfrac{1}{3}$ = ____   b. $\dfrac{5}{6} + \dfrac{3}{8}$ = ____

c. $1\dfrac{3}{4} + 2\dfrac{2}{3}$ = ____   d. $6\dfrac{5}{6} + 2\dfrac{1}{3}$ = ____

23. Subtract.

a. $\dfrac{1}{2} - \dfrac{1}{3}$ = ____   b. $\dfrac{4}{5} - \dfrac{3}{4}$ = ____

c. $6\dfrac{1}{2} - 2\dfrac{1}{4}$ = ____   d. $7\dfrac{3}{4} - 4\dfrac{4}{5}$ = ____

24. Multiply.

a. $\dfrac{1}{5}$ x 3 = ____   b. $\dfrac{1}{7}$ x 9 = ____

c. $\dfrac{2}{3}$ x 5 = ____   d. $\dfrac{4}{5}$ x 8 = ____

e. $2\dfrac{1}{4}$ x 3 = ____   f. $\dfrac{4}{5}$ x 7 = ____

25. Multiply.

a. $\dfrac{1}{5}$ x $\dfrac{1}{3}$ = ____   b. $\dfrac{1}{4}$ x $\dfrac{1}{2}$ = ____

c. $\dfrac{3}{4}$ x $\dfrac{1}{5}$ = ____   d. $\dfrac{2}{3}$ x $\dfrac{1}{7}$ = ____

e. $\dfrac{2}{5}$ x $\dfrac{2}{3}$ = ____   f. $\dfrac{3}{4}$ x $\dfrac{3}{5}$ = ____

26. Multiply.

a. $\dfrac{2}{3}$ x $4\dfrac{1}{2}$ = ____   b. $\dfrac{3}{5}$ x $1\dfrac{3}{4}$ = ____

c. $2\dfrac{2}{5}$ x $\dfrac{2}{3}$ = ____   d. $4\dfrac{1}{2}$ x $\dfrac{2}{3}$ = ____

e. $\dfrac{2}{3}$ x $7\dfrac{1}{5}$ = ____   f. $9\dfrac{1}{3}$ x $2\dfrac{3}{4}$ = ____

27. Divide.

    a. $4 \div \dfrac{2}{3}$ = _____   b. $9 \div \dfrac{5}{7}$ = _____

    c. $\dfrac{1}{2} \div \dfrac{3}{5}$ = _____   d. $\dfrac{7}{8} \div \dfrac{5}{6}$ = _____

28. Divide.

    a. $3\dfrac{1}{2} \div \dfrac{3}{4}$ = _____   b. $4\dfrac{2}{3} \div \dfrac{2}{5}$ = _____

    c. $2\dfrac{1}{4} \div \dfrac{1}{2}$ = _____   d. $3\dfrac{1}{5} \div 1\dfrac{2}{4}$ = _____

29. The total weight of three objects is $10\dfrac{1}{2}$ lbs.

    The first weighs $4\dfrac{3}{8}$ lbs., and the second $3\dfrac{1}{4}$ lbs.

    Find the weight of the third object.   _____

30. The difference between two numbers is $1\dfrac{2}{3}$.

    The larger number is $4\dfrac{1}{6}$.

    a. What is the smaller number?   _____

    b. What is the sum of the two numbers?   _____

31. A $3\dfrac{1}{2}$ -gallon container is filled with water

    to three-fifths its capacity.

    How many gallons of water are there?   _____

32. AB is $\dfrac{3}{4}$ inch long.   A _____ B

    XY is $1\dfrac{1}{2}$ times as long as AB.   X _____ Y

    How long is XY?   _____

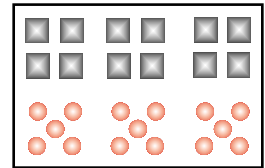33. 1 inch = 2.54 centimeters.

    How many centimeters are in 2.5 inches?   _____

34. a. What is the reciprocal of $\dfrac{5}{6}$?   _____

    b. How is a number and its reciprocal related? _____

                       Placement Test E

35. Study the picture.

   What is the squares-to-circles ratio? _____

36. John's height to Kate's is 6:5.

   John is 5' tall.

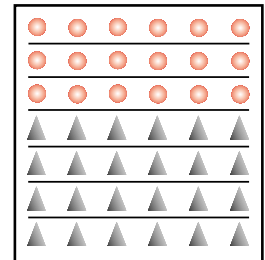   How tall is Kate?   _____

37. You want to divide $90 between Sue and Rob using a ratio 2:3.

   How much does each one get?   _____

38. Study the picture.

   What is the circles-to-triangles ratio?_____

39. In the picture,

   a. What fraction of all items are the triangles?   _____

   b. What fraction of all items are the circles?   _____

40. You have 40 coins: dimes and quarters.

   The dimes-to-quarters ratio is 3:5.

   a. What fraction of all coins are the quarters?   _____

   b. How many quarters do you have?

   c. What is the value of the quarters you have?   _____

41. Express in simplified form.

   a. 18:27   = ___   b. 175:200 = ___

   c. 0.5:0.35 = ___   d. 2.4:3.6 = ___

42. Which two of the following ratios make a proportion?

   a. $\frac{6}{9}$ b. $\frac{12}{15}$ c. $\frac{9}{12}$ d. $\frac{16}{24}$ _____

43. In a proportion, the extremes are 24 and 15 and the means are 18 and N

   What number is N?   _____

44. a. Solve for N. $\dfrac{N}{145} = \dfrac{7}{10}$　　　　　b. Solve for X. $\dfrac{4}{15} = \dfrac{126}{X}$

45. 7% of our flowers are red roses. What does this statement mean?

46. Janet saves 25% of the money that she earns.

    When she earns $300, how much money does she save?

47. Express as a percent.

    a. 0.05 =　　　　　　　　b. 0.46 =　　　　　　　　c. 0.342 =

48. Express as a decimal.

    a. 4% =　　　　　　　　b. 23% =　　　　　　　　c. 15.8% =

49. Express as a fraction in simplest form.

    a. 60% =　　　　　　　　　　　　　　b. 65% =

    c. 4.8% =　　　　　　　　　　　　　　d. $2\dfrac{2}{3}$ % =

50. Express as a percent.

    a. $\dfrac{4}{25}$ =　　　　　　　　　　　　　　b. $\dfrac{3}{5}$ =

51. Given that the sales tax in a city is 8%, find the tax on the following purchases.

    a. A suit that costs $75.00　　　　　_____

    b. A record that costs $4.50　　　　　_____

52. The amount of interest paid by a bank to a depositer depends upon three

    conditions: principal, rate, and period of time. What does each term mean?

    Principal:　　_____
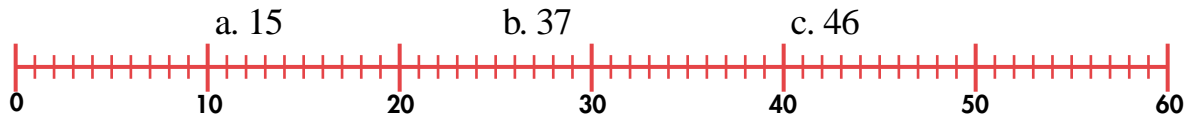
    Rate:　　　　_____

    Period of time: _____

53. You have $400 in a savings account that pays interest at a rate of 6%.
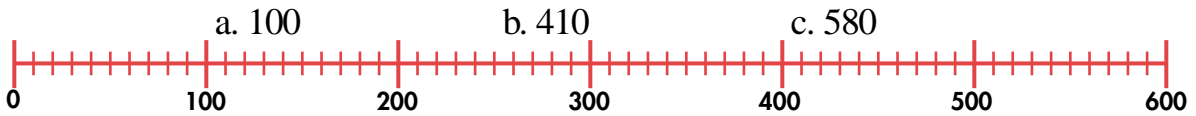
    a. What is the interest you obtain in one year?　_____

    b. What is the interest you obtain in 6 months?　_____

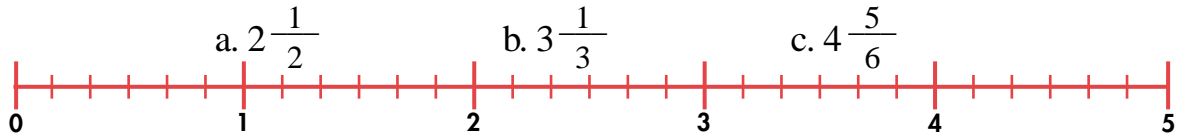   c. What is the interest you obtain in 5 months?　_____

Placement Test E

54. On the number line below, locate the points that correspond to:

a. 15   b. 37   c. 46

```
+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
0          10          20          30          40          50          60
```

55. On the number line below, locate the points that correspond to:

a. 100   b. 410   c. 580

```
+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
0          100          200          300          400          500          600
```

56. On the number line below, locate the points that correspond to:

a. $2\frac{1}{2}$ b. $3\frac{1}{3}$ c. $4\frac{5}{6}$

```
+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
0          1          2          3          4          5
```

57. Bill, Jim and Dan are the best players on the basketball team.

The graph below shows the number of baskets they scored last season.

DAN
JIM
BILL

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
Number of Baskets
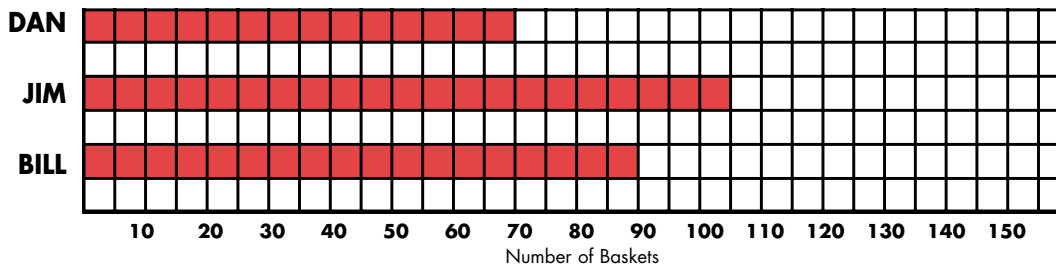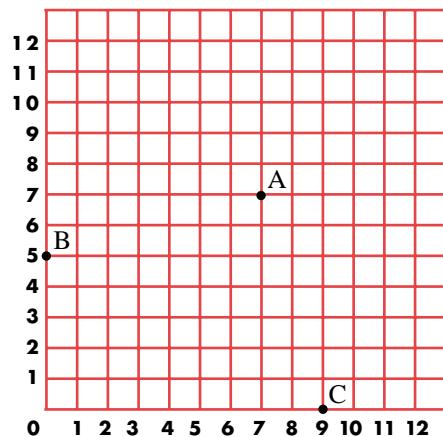
a. Who is the best player?   _____

What is his score?   _____

b. How many more baskets did
Bill score than Dan?   _____

58. On the grid, what number pairs are
represent by the points:

A_____   B_____   C_____

59. On the grid, locate the points that
represent the number pairs:

M (1,6)   N (0,9)   O (7,0)

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Although some of the answers may seem obvious, we have included the answers to all of the Placement Test questions within the following table.

Level 14		Level 15		Level 16	
Question	Answer	Question	Answer	Question	Answer
1	A	21a	4	35	4:5
2	4/5, 1/5	21b	25	36	4' 2"
3	36	21c	6	37	Sue $36
4	15	21d	2		Rob $54
5	30	21e	5	38	3:4
6	513	21f	8	39a	4/7
7	90	22a	5/6	39b	3/7
8	60	22b	1 10/48	40a	5/8
9	70	22c	4 5/12	40b	25
10	64	22d	9 1/6	40c	$6.25
11a	4	23a	1/6	41a	2:3
11b	6	23b	1/20	41b	7:8
11c	40	23c	4 1/4	41c	10:7
11d	7	23d	2 19/20	41d	2:3
11e	23	24a	3/5	42	a and d
11f	49	24b	1 2/7	43	20
12a	1 3/5	24c	3 1/3	44a	101.5
12b	2 1/4	24d	6 2/5	44b	472.5
12a	3 7/10	24e	6 3/4	45	7/100
13a	7/2	24f	5 3/5	46	$75
13b	32/5	25a	1/15	47a	5%
13c	97/10	25b	1/8	47b	46%
14a	3/5	25c	3/20	47c	34.2%
14b	5/7	25d	2/21	48a	0.04
14c	5/9	25e	4/15	48b	0.23
15a	1 1/7	25f	9/20	48c	0.158
15b	1 2/9	26a	3	49a	3/5
15c	7	26b	1 1/20	49b	13/20
15d	4	26c	1 3/5	49c	1/125
15e	7	26d	3	49d	11/300
15f	9	26e	4 4/5	50a	16%
15g	9 2/3	26f	25 2/3	50b	60%
16a	3/7	27a	6	51a	$6.00
16b	2/7	27b	12 3/5	51b	$0.36
16c	2/3	27c	5/6	52	$ Deposit
16d	1 2/5	27d	1 1/20		% Interest
16e	9 2/3	28a	4 2/3		Time Deposit
16f	3 1/5	28b	11 2/3	53a	$24.00
17a	7 2/3	28c	4 1/2	53b	$12.00
17b	3 4/7	28d	2 2/15	53c	$10.00
17c	3/5	29	2 7/8	54	
17d	6 1/2	30a	2 1/2	55	
17e	2 1/2	30b	6 2/3	56	
18a	6/7	31	2 1/10	57a	Jim
18b	1 3/5	32	1 1/8		105
18c	7 1/2	33	6.35	57b	20
18d	47 1/4	34a	1 1/5	58	A (7,7)
19a	10	34b	Product=1		B (0,5)
19b	18				C (9,0)
19c	8			59	
19d	7 1/2				
20a	1/6				
20b	1/28				
20c	3				
20d	2				
20e	3				
20f	5 7/8				

Mathematics Programs Associates (MPA),
a Long Island-based family enterprise providing educa-
tional products and consulting services, exists today primarily
due to the vision and determination of its founder, Dr. L. George Saad.
During the early 1950s, Dr. Saad taught mathematics education at the
University of Ain-shams in Cairo, Egypt. In 1954, with an innovative idea for self-
teaching, he enrolled as a doctoral candidate at the University of Birmingham in
England. During the following three years, Dr. Saad devoted his research to the ele-
mentary and secondary students' understanding of basic mathematics, and he developed
the methodology for a self-teaching mathematics program. In 1957, Dr. Saad received the
Ph.D. in mathematics education. He then returned to Cairo and began the development of
a government-sponsored mathematics curriculum for use throughout the country's elemen-
tary school system. In 1959, samples of Dr. Saad's materials were tested in the Cairo schools
and, a few years later, his curriculum was being used throughout the country and in other
Middle Eastern nations. Due to his popularity in the Middle East, in 1969, Dr. Saad was
invited to the United States as a visiting professor at the State University of New York, and
in the same year, accepted a professorship at Long Island University. In 1970, with an
inspiration to repeat his success, Dr. Saad immigrated his family to the United States
and began working on the rudiments of a self-teaching mathematics workbook
series. In 1974, he incorporated MPA in New York to design, develop and dis-
tribute his work. Today, educators and students in the United States, and
many other nations throughout the world, are benefiting from Dr.
Saad's lifelong achievement,

Developmental Mathematics
A Self-Teaching Program