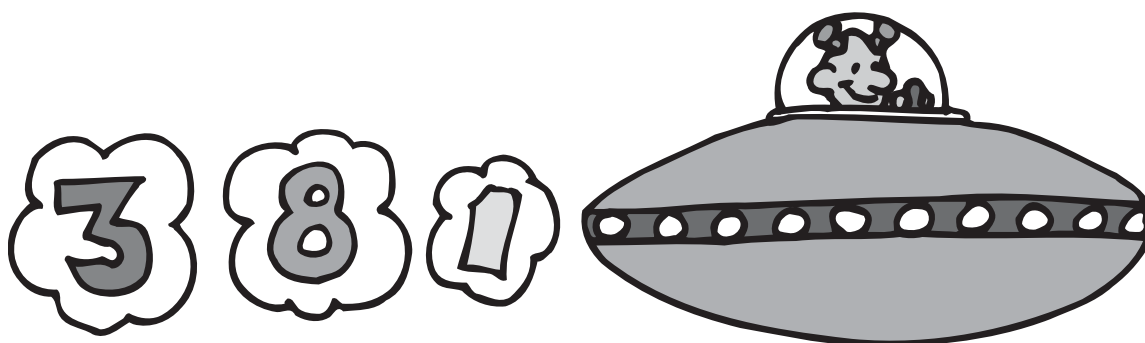


MATH PHONICS™

PRE-ALGEBRA

**Quick Tips and Alternative
Techniques for Math Mastery**



BY MARILYN B. HEIN
ILLUSTRATED BY RON WHEELER



Teaching & Learning Company

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THIS BOOK BELONGS TO

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DEDICATION

To my husband and children who love, support and inspire me.

Cover art by Ron Wheeler

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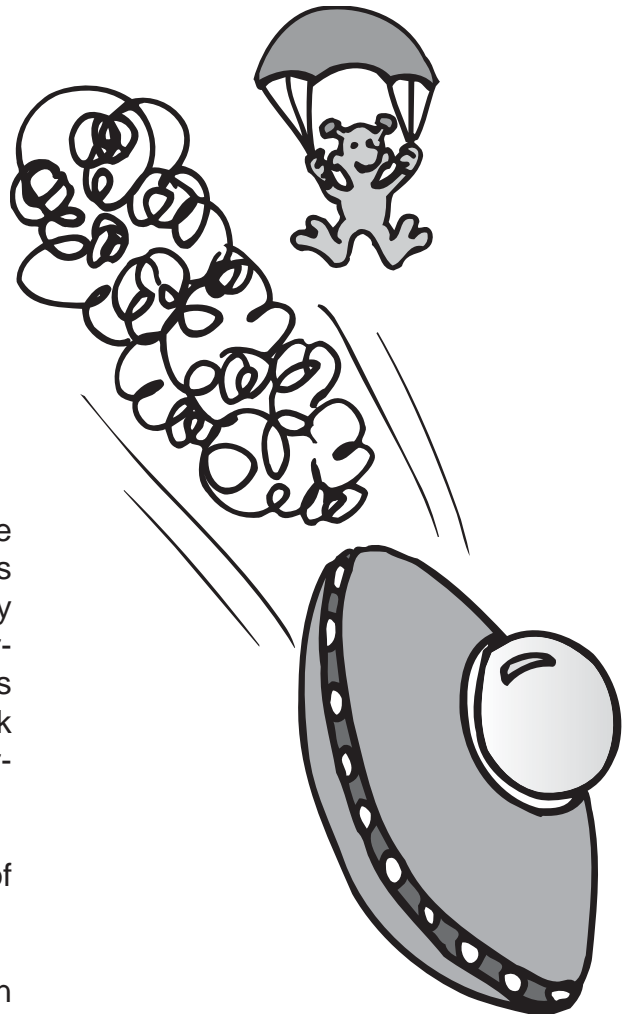




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HELPFUL RULES

ADDITION RULES:

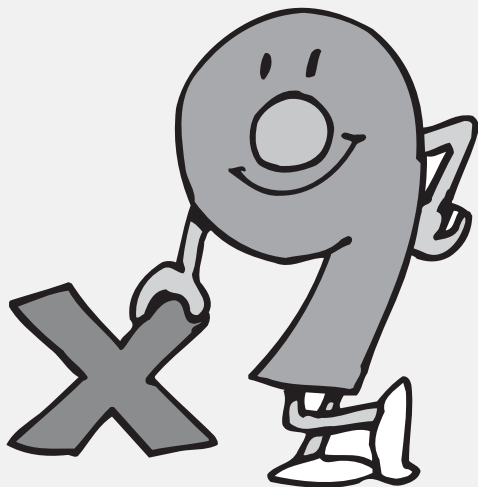
1. When adding doubles, the answer is always an even number. For $6 + 6$, count by twos up to the sixth number or 12. For a quicker answer, use $5 + 5$ as a foundation fact. Students should know $5 + 5$ is 10 because they have 10 fingers. Then $6 + 6$ is the next even number after 10. Also, $10 + 10$ is a foundation fact. $10 + 10$ is 20. $9 + 9$ is the even number just before 20 or 18.
2. When adding number neighbors, two numbers side by side on the number line (e.g. $5 + 6$), double the smaller number and add 1. $5 + 5 = 10$ and $5 + 6 = 11$. The answer to a number neighbor problem is always an odd number.
3. When adding skip numbers (e.g. $5 + 7$), double the smaller number and add 2. $5 + 5 = 10$ and $5 + 7 = 12$
4. When adding 10 to a one-digit number (e.g. $8 + 10$), put a 1 in the 10s place. $8 + 10 = 18$
5. When adding 10 to a two-digit number (e.g. $28 + 10$), add one to the number in the 10s place. $28 + 10 = 38$
6. When adding 9 to a number, add 10 and take away 1. $7 + 9 = 17 - 1 = 16$
7. When adding 8 to a number, add 10 and take away 2. $6 + 8 = 16 - 2 = 14$



MORE HELPFUL RULES

MULTIPLICATION RULES:

1. Multiplying by 2: The answer is that number added to itself—the doubles in addition. $9 + 9 = 18$ and $9 \times 2 = 18$
2. Multiplying by 4: (e.g. 8×4) Think of $2 \times 8 = 16$. Double the 16— $16 + 16 = 32$ so $8 \times 4 = 32$.
3. Multiplying by 5: 5 times an odd number ends in 5, and 5 times an even number ends in a zero. When multiplying 5 by an even number, take half of the even number and put that in the 10s place (e.g. 5×8). Take half of the 8 which is 4—the answer is 40. It's like 8 nickels equals 4 dimes. $5 \times 8 = 40$
4. Multiplying by 7: The first three multiples of 7 are in the column under the 7 on any calendar. They are 14, 21, 28.
5. Multiplying by 9: The multiples of 9 are 9, 18, 27, 36, 45, 54, 63, 72, 81. Each pair of numerals in an answer adds up to 9 ($1 + 8, 2 + 7, 3 + 6, 4 + 5$) and the last four are the reverse of the first four. When multiplying nine times any number (e.g. 9×7), subtract one from the other number ($7 - 1 = 6$). Put that number in the 10s place. Then think of the other number in the pairs above— $6 + 3 = 9$. The answer is 63. $9 \times 7 = 63$



DIVISION RULES:

1. Divisible by 2: any number that ends in an even number—2, 4, 6, 8 or 0.
2. Divisible by 3: add the numerals of the number. If the sum is divisible by 3, the original number is also divisible by 3.
3. Divisible by 5: any number that ends in a 0 or 5.
4. Divisible by 6: any number that is divisible by 2 and 3.
5. Divisible by 9: add the numerals of the number. If the sum is divisible by 9, the number is divisible by 9.

NOTE: For more rules, see *Math Phonics™—Addition*, page 87; *Math Phonics™—Subtraction*, page 92; *Math Phonics™—Multiplication*, page 85; *Math Phonics™—Division*, page 93.

Name _____

SKILLS REVIEW



1.
$$\begin{array}{r} 35 \\ + 78 \\ \hline \end{array}$$

2.
$$\begin{array}{r} 294 \\ + 307 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 146 \\ 791 \\ + 637 \\ \hline \end{array}$$

4.
$$\begin{array}{r} 37.25 \\ + 55.37 \\ \hline \end{array}$$

5.
$$\begin{array}{r} 127.1 \\ - 91.7 \\ \hline \end{array}$$

6.
$$\begin{array}{r} 145 \\ - 99 \\ \hline \end{array}$$

7.
$$\begin{array}{r} 752 \\ - 64 \\ \hline \end{array}$$

8.
$$\begin{array}{r} 408 \\ - 59 \\ \hline \end{array}$$

9.
$$\begin{array}{r} 29 \\ \times 3 \\ \hline \end{array}$$

10.
$$\begin{array}{r} 8.5 \\ \times 12 \\ \hline \end{array}$$

11.
$$\begin{array}{r} 12.5 \\ \times 7.3 \\ \hline \end{array}$$

12.
$$\begin{array}{r} 376 \\ \times 254 \\ \hline \end{array}$$

13. $172.1 + 28 = \underline{\hspace{2cm}}$

14. $126 - 77.2 = \underline{\hspace{2cm}}$

15. $675 + 982.1 = \underline{\hspace{2cm}}$

Solve for n:

16. $\frac{n}{16} = \frac{6}{4}$

17. $\frac{n}{8} = \frac{42}{48}$

18. $\frac{n}{9} = \frac{35}{45}$

19. $7 \overline{) 504}$

20. $16 \overline{) 1.92}$

21. $2.1 \overline{) 882}$

22. 10% of 300 = _____

23. 20% of 200 = _____

24. 1% of 500 = _____

25.
$$\begin{array}{r} 2\frac{2}{3} \\ + 3\frac{3}{4} \\ \hline \end{array}$$

26.
$$\begin{array}{r} 9\frac{3}{4} \\ - 6\frac{4}{5} \\ \hline \end{array}$$

27. $\frac{3}{5} \times 2\frac{1}{7} =$

Change to decimals:

28. $3\frac{3}{8} \div 1\frac{1}{2} =$

29. $\frac{7}{8} =$

30. $\frac{1}{3} =$