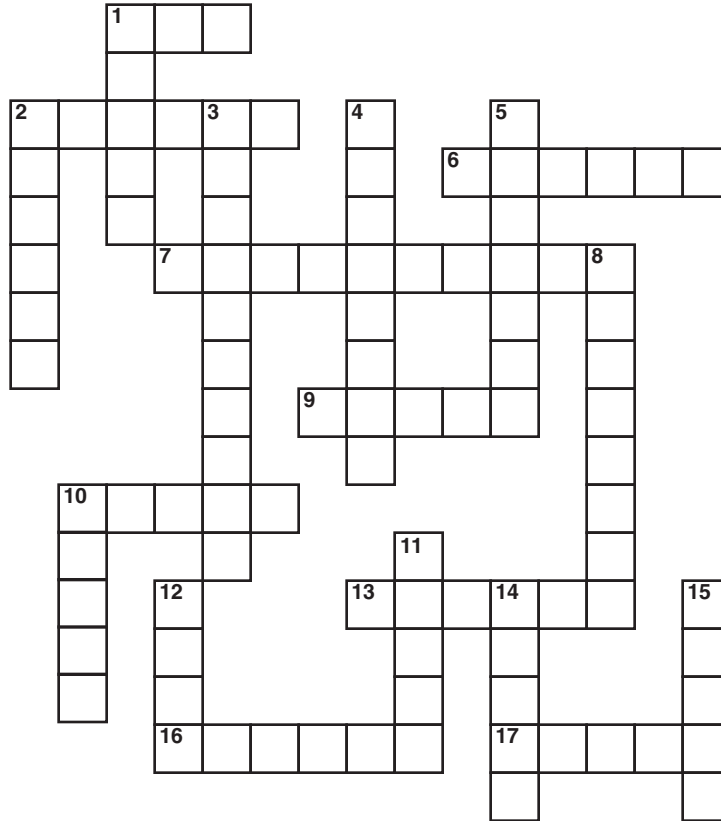


CHAPTER
1

Enrichment
All Kinds of Numbers

Complete the crossword puzzle.



ACROSS

1. $\frac{5}{9} + \frac{13}{9} =$ _____
2. $4.8 \div 0.16 =$ _____
6. $\frac{2}{5} \div \frac{2}{7} =$ seven _____
7. $1.09 + 4.2 =$ five and twenty-nine _____
9. $\frac{1}{10} + \frac{3}{5} =$ _____ tenths
10. $20 \div 0.5 =$ _____
13. $10.29 - 7.09 =$ three and two _____
16. $\frac{1}{3} \div \frac{4}{3} =$ one _____
17. $14 \times 22 =$ three hundred and _____

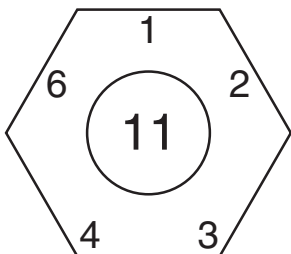
DOWN

1. $\frac{1}{2} - \frac{1}{6} =$ one _____
2. $1\frac{3}{8} \times 1\frac{3}{5} =$ two and _____ hundredths
3. $12 - 11.999 =$ one _____
4. $1.06 + 11.94 =$ _____
5. $180 \div 12 =$ _____
8. $\frac{1}{2} \times \frac{6}{7} =$ three _____
10. $46 + 4 =$ _____
11. $\frac{2}{5} \times \frac{1}{4} =$ one _____
12. $\frac{7}{8} - \frac{3}{8} =$ one _____
14. $0.2 \times 1.5 =$ _____ tenths
15. $158 - 98 =$ _____

CHAPTER **Enrichment**
2 **Order Up!**

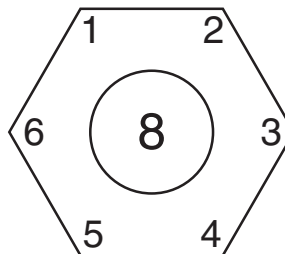
Use each number around the edges of the hexagon exactly once to arrive at the result in the center of the hexagon.

1.



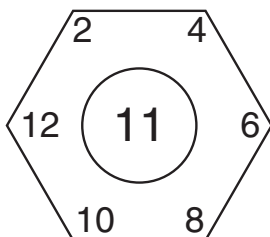
$$\square (\square - \square) + \square \div \square = 11$$

2.



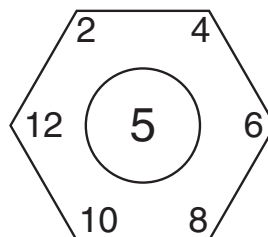
$$(\square + \square)^{\square} \div \square + \square - \square = 8$$

3.



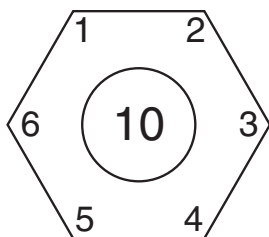
$$(\square - \square)^{\square} + \square \div \square - \square = 11$$

4.



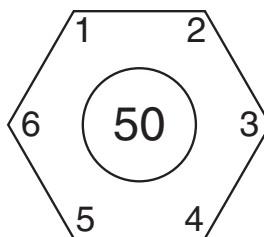
$$\square \times \square \div \square + \square \div \square - \square = 5$$

5.



$$\square - \square + \square (\square \div \square) - \square = 10$$

6.



$$\square (\square \div \square - \square + \square^{\square}) = 50$$

CHAPTER

3

Enrichment***Magic Square***

The rows, columns, and diagonals of a magic square all have the same sum.
Create a magic square by solving these equations.

1.	2.	3.	4.
5.	6.	7.	8.
9.	10.	11.	12.
13.	14.	15.	16.

1. $\frac{x}{2} = 4$

2. $t + 7 = 2$

3. $-2m = 12$

4. $k - 10 = -5$

5. $-b = 3$

6. $1 = \frac{y}{2}$

7. $-9h = -27$

8. $n + 4 = 4$

9. $-12 = q - 13$

10. $16 = -8x$

11. $-5 = f - 4$

12. $\frac{t}{2} = 2$

13. $r = 6 - 10$

14. $y - 1 = 6$

15. $-3 = -\frac{t}{2}$

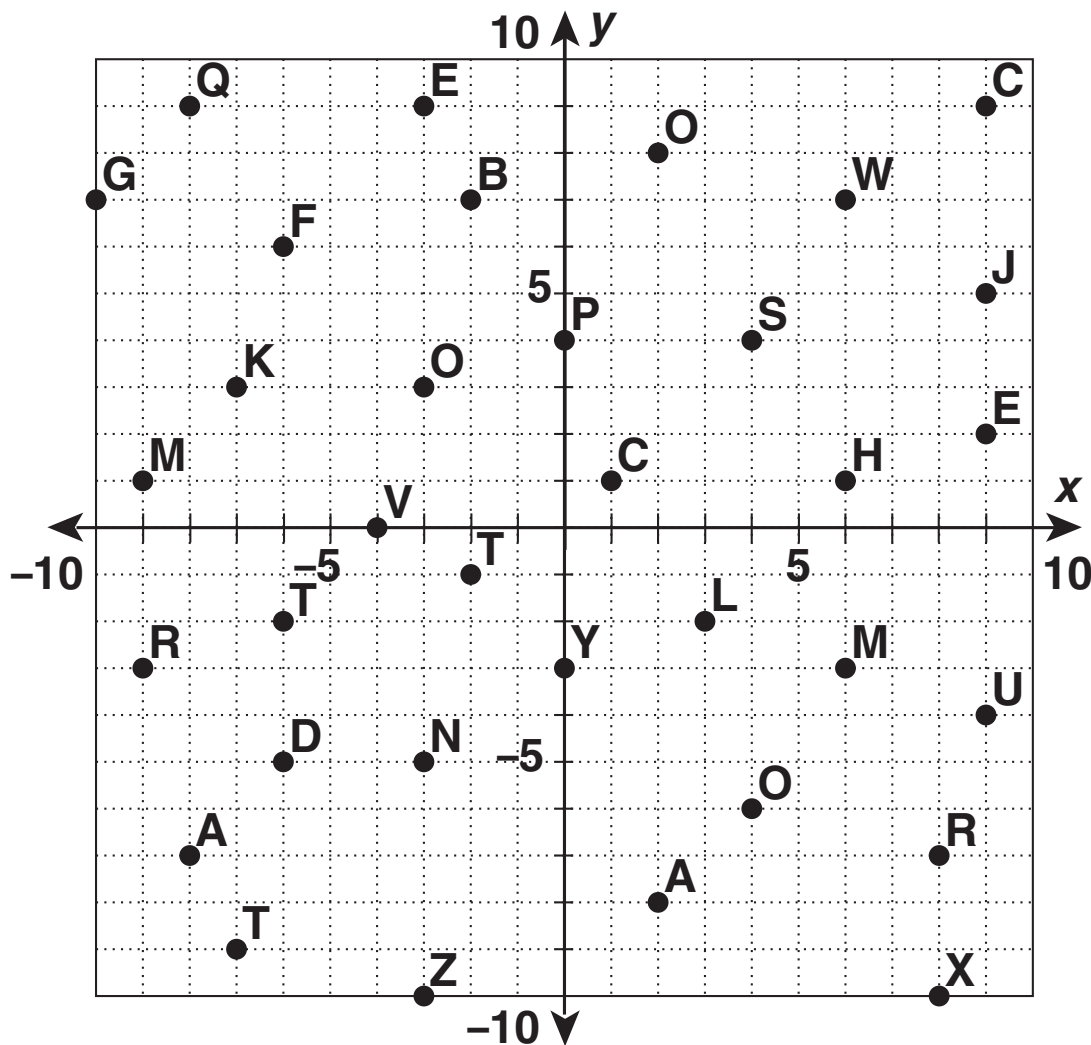
16. $-3m = 21$

What is the magic sum? _____

CHAPTER
4

Enrichment
Coordination

Write the letter that corresponds to the coordinate pair in the blank provided to discover a common mathematical expression.



 (-10, 7) (8, -7) (9, 2) (2, -8) (-6, -2) (-3, 9) (4, 4) (-2, -1)

 (1, 1) (4, -6) (-9, 1) (6, -3) (-3, 3) (-3, -5)

 (-6, 6) (-8, -7) (9, 9) (-7, -9) (2, 8) (-9, -3)

CHAPTER **Enrichment**
5 **Perfect Numbers**

A perfect number is a number which is the sum of its own positive factors (other than itself). For example, the following numbers are perfect.

$$6 = 1 + 2 + 3$$

$$28 = 1 + 2 + 4 + 7 + 14$$

$$496 = 1 + 2 + 4 + 8 + 16 + 31 + 62 + 124 + 248$$

The next perfect number is 8128. What is the fifth perfect number? _____

To find the answer, solve each equation and write your answer in the blanks provided at the bottom of the page.

1. $7x - 12 = 9$

2. $\frac{x}{3} - 4 = -3$

3. $25 - 3x = 10$

4. $-2 = \frac{x}{5} - 3$

5. $4(2x - 1) = -4$

6. $7(2 - x) = -7$

7. $25x - 10x = 40 + 5$

8. $15 - \frac{x}{6} = 14$

_____ , _____ , _____ , _____ , _____ , _____ , _____ , _____
1. 2. 3. 4. 5. 6. 7. 8.

CHAPTER **Enrichment**
6 *Multiply It Out*

Evaluate each expression in Column 1 for the value given and match it to the correct answer in Column 2. Then, write the letter above the corresponding exercise number to discover a common mathematical property.

Column 1

1. $x - 9$, for $x = 3$
2. $2m + 3$, for $m = -2$
3. $\frac{t}{2} + 6$, for $t = 10$
4. $15 - 4y$, for $y = 3$
5. $-3x + 1$, for $x = -3$
6. $\frac{5}{2} - \frac{d}{2}$, for $d = 3$
7. $\frac{p}{3} + 12$, for $p = -9$
8. $-6 + 4x$, for $x = -\frac{1}{2}$
9. $\frac{a}{3} - 10$, for $a = 9$
10. $7f + 8$, for $f = 0$
11. $-5x - 6$, for $x = 1$
12. $-\frac{c}{5} + 3$, for $c = 15$

Column 2

- B** -8
D 8
E 11
I -1
O -7
P -11
R 3
S 1
T -6
U 10
V 0
Y 9

10	2	6	1	4	2	8	5	1	2	12	3
11	4	9	11	3	4	1	7				

CHAPTER 7 **Enrichment**
Fraction, Decimal, and Percent Mania

What did one math book say to the other math book? _____

To discover the answer, write the equivalent fraction and decimal for each percent. Then, cross out each answer in the code box. The remaining letters will reveal the solution.

- | | |
|---------------|---------------|
| 1. 15% _____ | 2. 20% _____ |
| 3. 32% _____ | 4. 50% _____ |
| 5. 60% _____ | 6. 85% _____ |
| 7. 12% _____ | 8. 5% _____ |
| 9. 72% _____ | 10. 25% _____ |
| 11. 40% _____ | 12. 95% _____ |
| 13. 70% _____ | 14. 75% _____ |
| 15. 44% _____ | |

$\frac{8}{25}$ P	$\frac{3}{4}$ E	$\frac{3}{20}$ T	$\frac{3}{50}$ B	$\frac{19}{20}$ A	$\frac{11}{25}$ S	$\frac{4}{5}$ O	$\frac{1}{2}$ N	$\frac{17}{20}$ H	$\frac{1}{10}$ Y	$\frac{3}{25}$ E	$\frac{7}{20}$ D
$\frac{13}{20}$ O	$\frac{18}{25}$ N	$\frac{9}{10}$ I	$\frac{1}{4}$ S	$\frac{2}{5}$ E	$\frac{11}{50}$ H	$\frac{3}{10}$ A	$\frac{3}{5}$ T	$\frac{7}{10}$ I	$\frac{11}{20}$ V	$\frac{1}{20}$ W	$\frac{1}{5}$ A
0.2 L	0.1 E	0.6 B	0.05 T	0.8 P	0.5 O	0.9 R	0.15 E	0.55 O	0.7 S	0.4 H	0.65 B
0.95 D	0.35 L	0.75 P	0.32 A	0.44 S	0.13 E	0.85 T	0.72 H	0.12 R	0.73 M	0.3 S	0.25 E

CHAPTER

Enrichment**8*****The Power of Pi***

The irrational number pi is a non-repeating, non-terminating decimal number, 3.14... .

Evaluate each power below and place the last digit of each answer in the blanks provided to discover the first 20 decimal places of pi.

1. 9^2 _____

2. 2^6 _____

3. $3^2 + 2^5$ _____

4. 25^2 _____

5. 7^2 _____

6. 2^9 _____

7. 4^4 _____

8. $10^2 - 5^2$ _____

9. 7^3 _____

10. 5^4 _____

11. 2^7 _____

12. 9^3 _____

13. $8^3 - 5^3$ _____

14. $13^2 \cdot 8^0$ _____

15. $11^2 + 8^3$ _____

16. $4^2 + 6^2$ _____

17. 3^5 _____

18. $2^2 \cdot 2^5$ _____

19. $3^3 \cdot 2^5$ _____

20. $12^2 - 2^7$ _____

3. _____

CHAPTER

9

Enrichment**Factoring Fun**

What is the Roman numeral MMDCCXLVIII equivalent to in Arabic numerals? _____

To discover the answer, factor each trinomial. Then, answer the four questions at the bottom of the page. Place each answer in the blank above the corresponding exercise number.

1. $x^2 - 6x + 8$

2. $x^2 + x - 6$

3. $x^2 - 5x + 4$

4. $x^2 + x - 2$

5. $x^2 - 2x - 8$

6. $x^2 + x - 12$

7. $x^2 - x - 12$

8. $x^2 - 3x - 4$

9. $x^2 - 3x + 2$

10. $x^2 - 8x + 16$

11. $x^2 - 2x - 15$

12. $x^2 + 5x + 6$

13. $x^2 - 5x + 6$

14. $x^2 + x - 20$

15. $x^2 - x - 2$

16. $x^2 + 4x - 5$

17. $x^2 + 2x - 8$

18. $x^2 + 3x - 10$

1. How many of the trinomials have a factor of $x + 1$?
2. How many of the trinomials have a factor of $x - 2$?
3. How many of the trinomials have a factor of $x + 3$?
4. How many factors of $x - 4$ do you see?

CHAPTER 10 **Enrichment**
A Maze of Multiplication

Travel around the maze as you solve each multiplication problem. Each answer will touch the previous answer. Shade your answers in the grid to discover an amazing scientific accomplishment. Answers may be written up, down, forwards, backwards, or diagonally and boxes may be used more than once if needed.

- | | |
|------------------------|------------------------|
| 1. $x(x + 3)$ | 11. $(x - 8)(x + 8)$ |
| 2. $(x + 1)(x + 7)$ | 12. $5x(9 - 4x)$ |
| 3. $(x - 3)(x + 5)$ | 13. $2(7x - 3)$ |
| 4. $x(2x - 8)$ | 14. $(x - 10)(x - 3)$ |
| 5. $8x(1 - x)$ | 15. $(5 + 2x)(6 - x)$ |
| 6. $(x + 3)(x - 7)$ | 16. $(3x - 7)(3x + 7)$ |
| 7. $(2x + 1)(x - 6)$ | 17. $2x(5 - 2x)$ |
| 8. $3x(9 - x)$ | 18. $(8x + 1)(5x - 6)$ |
| 9. $(5x - 1)(3x + 1)$ | 19. $(3x - 2)(3x + 2)$ |
| 10. $(4x + 2)(3x + 3)$ | 20. $(7x + 3)(x - 5)$ |

Finish here. ← ↓ Start here.

x^2	-	$7x$	x^2	11	+	$7x$	-	8	15	x^2	+	$3x$	+	2	x^2	+	4	+	8	-	x^2	+	$7x$	$3x$	x^2
8	11	$9x$	$4x^2$	x	$9x$	14	-	19	$4x^2$	-	$5x$	+	x^2	x	+	$4x^2$	8	x^2	+	$9x$		11	23	+	14
$9x^2$	-	49	$10x$	8	+	x^2	4	23	11	+	$32x$	$3x$	23	+	8	+	$3x$	+	4	+	4	x	+	x^2	4
$7x$	$2x^2$	x	$3x$	-	11	$3x$	+	14	x^2	4	$5x$	-	$7x$	+	$8x$	14	+	x^2	+	$7x$	+	$5x$	$4x^2$	-	$5x$
4	+	-	$4x^2$	+	$4x^2$	19	+	$7x$	$9x$	14	$3x$	8	$7x^2$	x	-	+	-	-	-	$5x$	+	8	19	x	$7x$
-	$7x$	8	$7x$	-	$9x$	$40x^2$	-	$43x$	-	6	$9x^2$	-	4	+	$7x$	-	7	x^2	+	$2x$	-	15	$2x^2$	+	$5x$
x	+	19	-	+	-	23	+	$9x$	$3x$	11	+	19	11	4	+	4	11	-	-	$5x$	+	11	$3x$	-	$9x$
x^2	-	x^2	$3x$	-	30	$4x^2$	8	x^2	$4x^2$	4	$3x$	x^2	$9x$	+	x^2	+	8	x^2	x	14	8	+	x^2	x	$8x$
+	$7x$	4	-	+	-	$5x$	x	+	$7x$	+	11	+	$4x^2$	8	+	14	x	23	4	+	19	14	11	-	$4x^2$
$3x$	4	8	$13x$	-	+	64	-	x^2	6	+	$18x$	+	$12x^2$	4	$4x^2$	$3x$	$2x^2$	21	-	$4x$	-	x^2	$8x^2$	+	4
-	x	-	11	+	$45x$	$7x$	+	x	11	$7x$	8	4	1	+	$9x$	-	$7x$	$4x^2$	+	8	$5x$	+	8	+	11
x	x^2	$3x$	$9x$	-	4	19	4	+	$3x$	+	14	-	8	8	$11x$	+	$9x$	+	+	$7x$	23	x^2	+	x	$5x$
6	-	$14x$	$20x^2$	+	14	x^2	-	11	x^2	-	$2x$	8	$3x$	-	$7x$	8	+	$3x$	4	x^2	+	14	$9x$	$3x$	x^2
+	$7x$	11	$7x$	x	$9x$	$4x^2$	8	x^2	-	+	11	$7x$	6	+	x	x^2	$4x^2$	$5x$	+	$5x$	$9x$	11	$7x$	+	8
x^2	+	8	x^2	+	-	$3x$	-	$5x$	$15x^2$	$3x^2$	-	$27x$	$9x$	-	-	19	4	x^2	$5x$	-	$7x$	-	x	x^2	-

CHAPTER

11**Enrichment*****Good Luck Squares***

Shade each box that contains a perfect square number. Then, find its positive square root and shade that box as well.

50	17	31	80	42	99	69	300	18	115	46	91	63
72	94	65	89	550	10	8	121	97	950	59	150	73
39	615	54	78	16	106	32	112	15	88	19	825	29
125	60	215	211	225	117	377	76	9	82	105	52	85
22	800	81	1	12	250	21	47	196	25	13	115	45
815	4	114	37	116	6	53	7	500	101	525	36	68
51	400	43	113	93	58	40	325	650	715	71	11	28
750	49	725	23	111	144	925	64	74	33	315	169	61
86	98	14	625	900	107	256	109	30	100	5	700	56
57	75	83	110	102	415	20	90	915	95	350	108	77
600	70	66	24	450	48	25	425	850	26	104	84	38
34	87	44	92	79	515	35	103	67	96	55	41	27

CHAPTER **Enrichment**
12 Experiencing Exponents

Why should you never borrow a dime from a football coach?

To discover the answer, simplify the expressions in Column 1 and 2. Then, match the answer in Column 1 to the corresponding answer in Column 2 and write the letter above the corresponding exercise number in the blanks provided.

Column 1

1. $x^2 \cdot x^6$
2. $-2x \cdot 4x^5$
3. $5x \cdot x^2 \cdot 2x^2$
4. $(2x^3)^4$
5. $-3x^3 \cdot -4x^3$
6. $(2x)^2 \cdot 2x \cdot 9x^4$
7. $x^2y \cdot xy$
8. $(x^2y^3)^3$
9. $2x^2y \cdot (-6xy^3)$
10. $x^5y^5 \cdot 9xy$
11. $-10xy \cdot 2x$
12. $(2xy)(3xy)(4xy)$
13. $(x^2y)(3xy^3)$
14. $(xy)^4$
15. $(2x^2)^3 \cdot (x^4)^2$

Column 2

- A. $2^3 \cdot x^6 \cdot x^8$
- B. $xy \cdot x^5y^8$
- C. $2x^2 \cdot 6x^4$
- E. $2x^2y^2(12xy)$
- H. $(x^2)^4$
- K. $(-2x^2)^3$
- L. $10x^2 \cdot x^3$
- N. $xy^2 \cdot x^2$
- Q. $(3x^3y^3)^2$
- R. $(x^2y^2)^2$
- S. $3xy(x^2y^3)$
- T. $(5x^2)(-4y)$
- U. $(4x^6)^2$
- W. $(-3x^2y^2)(4xy^2)$
- Y. $(2x)^3 \cdot (3x^2)^2$

8 12 5 15 4 13 12

1 12

15 3 9 15 6 13

9 15 7 11 13

15 10 4 15 14 11 12 14 8 15 5 2

CHAPTER 13 **Enrichment**
Tendency Triangles

There are six sets of data. Find the mean, median, and mode of each set. For each data set, write the three measures of central tendency in the corners of the corresponding triangle. Be careful of overlapping triangles.

Data set 1: 2, 2, 3, 5, 4, 2, 3 Mean = _____, Median = _____, Mode = _____

Data set 2: 9, 1, 2, 7, 4, 1 Mean = _____, Median = _____, Mode = _____

Data set 3: 4, -1, 11, 7, 9, 4, 5, 1, 14 Mean = _____, Median = _____, Mode = _____

Data set 4: 14, 7, 1, 5, 4, 13, 1, 11 Mean = _____, Median = _____, Mode = _____

Data set 5: 2, 0, -1, -2, 5, 2, 0, 2 Mean = _____, Median = _____, Mode = _____

Data set 6: 8, 1, 4, 7, 1, 9, 12 Mean = _____, Median = _____, Mode = _____

