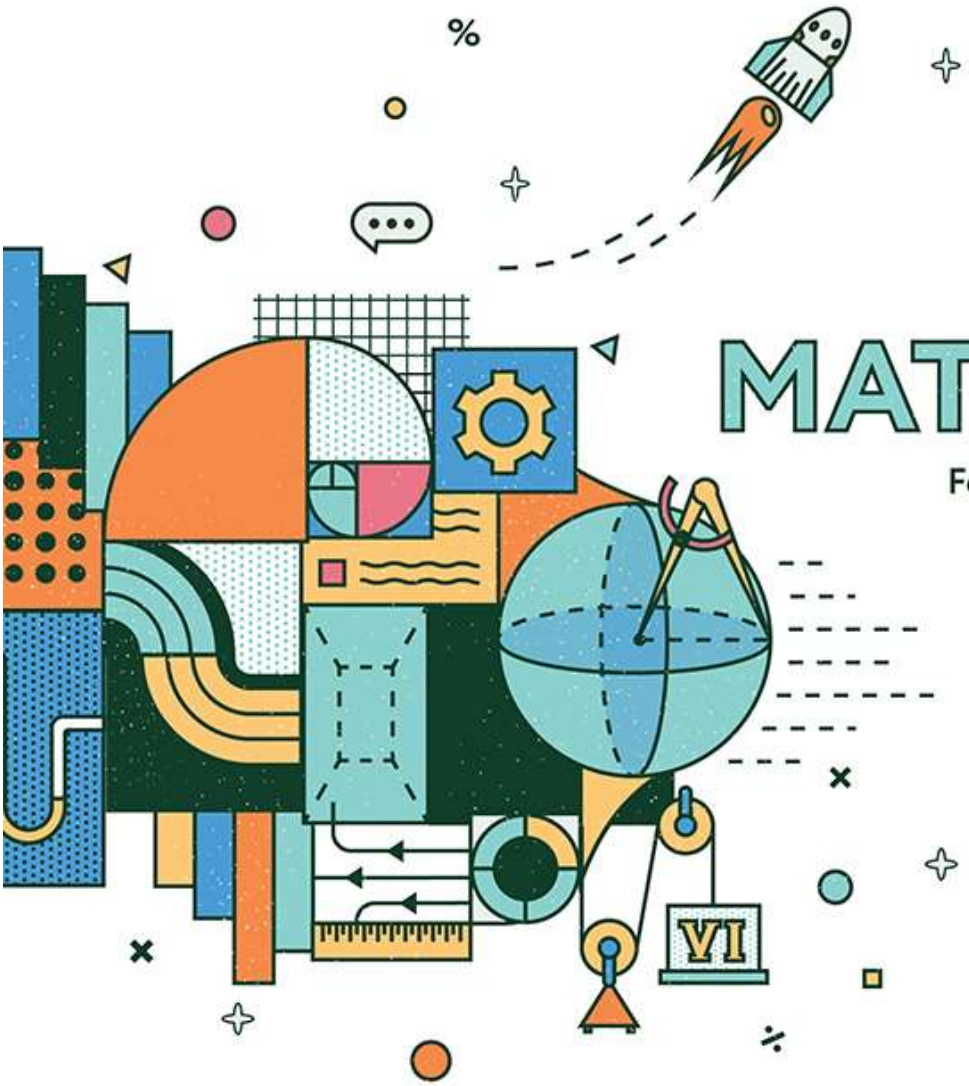

MATH 6

Fourth Edition

bju press
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Whole Number Place Value

How does the place value system show that math is a human activity?

Key Terms

- place value
- place value period
- standard form
- word form
- expanded form
- compare numbers
- round numbers

The value of a digit depends on its place within the number. A comma is used to separate the **place value periods** and makes the number easier to read.

H	T	O	,	H	T	O	,	H	T	O	,	H	T	O
Billions				Millions				Thousands				Ones		
4	7	3	,	6	0	1	,	0	8	2	,	5	9	3

Standard form	473,601,082,593
Word form	four hundred seventy-three billion, six hundred one million, eighty-two thousand, five hundred ninety-three
Expanded form	400,000,000,000 + 70,000,000,000 + 3,000,000,000 + 600,000,000 + 1,000,000 + 80,000 + 2,000 + 500 + 90 + 3
Expanded form with multiplication	$(4 \times 100{,}000{,}000{,}000) + (7 \times 10{,}000{,}000{,}000) + (3 \times 1{,}000{,}000{,}000) + (6 \times 100{,}000{,}000) + (1 \times 1{,}000{,}000) + (8 \times 10{,}000) + (2 \times 1{,}000) + (5 \times 100) + (9 \times 10) + (3 \times 1)$

Strategies for Comparing and Ordering Numbers

Compare the number of periods.

2,126,826 > 216,924

Millions Period > Thousands Period

Compare the places in a period.

75,541 < 675,809

Ten Thousands < Hundred Thousands

Compare the digits in a place.

15,893 < 15,938

8 Hundreds < 9 Hundreds

Exercises

Write the number in word form and expanded form.

1. 421,063,987

2. 673,911

3. 200,037,402,586

Use the numbers in problems 1–3 to find the answer.

4. Name the greatest place of each number.

5. In which numbers does the 3 have a value of 3,000?

6. Write the number with the least value in expanded form with multiplication.

Write the number in standard form.

7. 30 billions, 407 millions, 17 thousands, 603 ones

8. forty-five million, two hundred twenty thousand, three hundred seven

9. 300,000,000,000 + 40,000,000,000 + 6,000,000,000 + 50,000,000 + 9,000,000 + 60,000 + 8,000 + 700 + 4

Write a comparison sentence by using >, <, or =.

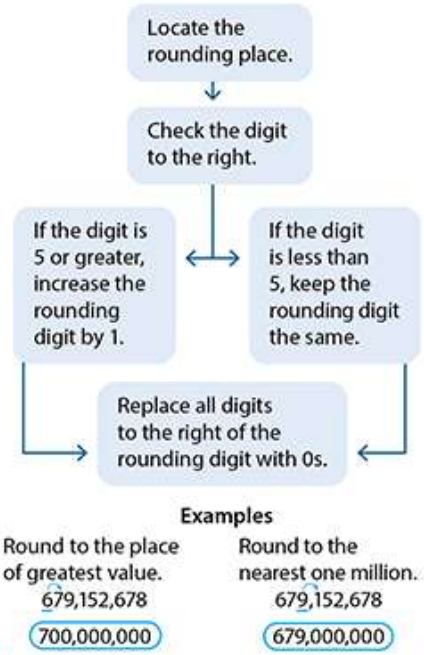
10. 14,625,902 ___ 5,986,597

11. 125,008 ___ 125,080

12. 893 million ___ 2 billion

13. 998,651,083 ___ 900,000,000 + 90,000,000 + 8,000,000 + 600,000 + 50,000 + 1,000 + 80 + 3

Rounding Whole Numbers



Examples

Round to the place of greatest value.
679,152,678
700,000,000

Round to the nearest one million.
679,152,678
679,000,000

Write the answer, using 568,932,475,018.

14. Round to the nearest ten million.

15. the value of each 5 in standard form

16. Round to the nearest one billion.

17. the value of the 9 in standard form

18. Round to the nearest hundred thousand.

19. the digit in the ten thousands place

20. 568,932,000,000 is rounded to the nearest ___.

21. the greatest place

Write the numbers from least to greatest.

22. 26,583 2,658 26,853 23,598

23. 703,567 703,765 703,675 703,766

Practice & Application

24. Write the number that is 1,000 more than 298,370.

25. Write the number that is 1,000 less than 6,581,257.

26. Write the standard form for 80,000,000 + 2,000,000 + 600,000 + 90,000 + 3,000 + 10.

27. Write 37,596,042 in word form.

28. Which two ten thousands is 81,960 between?

29. Round 351,798,200 to the greatest place.

30. Rearrange the digits in 21,034,065 to make the largest number possible. (Use all digits.)

31. Rearrange the digits in 21,034,065 to make the smallest number possible. (Use all digits.)

32. Explain how adding commas to 17398052 helps you read the number.

33. How does the place value system show that math is a human activity?

Adding Whole Numbers

How do I know whether my answer is reasonable?

Key Terms

- addition
- addend
- sum
- estimate
- rounding
- front-end estimation

Addition is used to find the total of two or more numbers or sets. The numbers or sets being added together are the **addends**. The total of the addends is the sum. To add, begin in the place with least value and continue to the place with greatest value, renaming as necessary.

$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 3{,}154 \\ +\ \ 861 \\ \hline 4{,}015 \end{array} \qquad \begin{array}{r} {\scriptstyle 1\ 1} \\ 159{,}043 \\ +\ 2{,}345{,}826 \\ \hline 2{,}504{,}869 \end{array}$$

An **estimate** is an approximate answer. An estimate can be used to check the accuracy of a solved problem. Estimates may be written, but the goal is to use mental math to find estimates.

To find an approximate sum, we can use **rounding** or **front-end estimation**. Sometimes a number may be rounded to a place other than the greatest place to give an approximate amount.

Rounding Whole Numbers

Rounding to the Greatest Place
Round each number to the place of greatest value.

Estimate		11
4,000	4,178	
+ 700	+ 682	
4,700	4,860	

Using Front-end Estimation
Add the digits in the two greatest places for a more accurate estimate.

Estimate		1
15,000	15,678	
+ 26,000	+ 26,311	
41,000	41,989	

Rounding to a Given Place
The Jones Hardware Store inventory list accounts for **617,603** nails. Mr. Jones rounds to the nearest one thousand and tells a customer he has about 618,000 nails in his store.

Exercises

Round each addend to the greatest place to estimate the sum.

1. 18,209 + 27,652 **2.** 143,688 + 81,704 **3.** 587,169 + 253,482 **4.** 3,945,100 + 1,069,388

Use front-end estimation to estimate the sum.

5. 36,249 + 37,155 **6.** 149,652 + 286,927 **7.** 48,015 + 39,866 **8.** 19,735 + 3,487

Add.

9.
$$\begin{array}{r} 139{,}728 \\ 403{,}680 \\ +\ 391{,}499 \\ \hline \end{array}$$

10.
$$\begin{array}{r} 1{,}397{,}240 \\ 600{,}817 \\ +\ 129{,}007 \\ \hline \end{array}$$

11.
$$\begin{array}{r} 14{,}659 \\ 72{,}019 \\ +\ 53{,}832 \\ \hline \end{array}$$

12.
$$\begin{array}{r} 900{,}000{,}000 \\ 17{,}580{,}013 \\ +\ 395{,}602 \\ \hline \end{array}$$

13. 15,642 + 1,389,420

14. 400,607 + 3,589

15. 136 + 49 + 210 + 108

Use the map to find the answer.

16. Mr. Johnson flew from his hometown of Los Angeles on a business trip. He flew to Chicago and then from Chicago to New York City. What was the total distance of his flights?

17. Mr. Brown met Mr. Johnson in New York City. How far did Mr. Brown fly if he flew from Seattle to Chicago and then from Chicago to New York City?

18. Round to the greatest place to estimate the number of miles flown by Mr. Johnson and Mr. Brown.

19. Find the number of miles Mr. Johnson flew while making a round trip (flying to the meeting and then flying home). Use problem 16 to solve.

Practice & Application

20. Add commas to 20043170.

21. Write the name of the greatest place in the number for problem 20.

22. Write 18,396,470,502 in expanded form.

23. Write *six hundred forty-nine thousand, five hundred seventeen* in standard form.

24. Write the value of the 9 in 19,325,644 in word form.

25. Write two facts with a sum of 12, using different addends for each fact.

26. Find the sum of 94, 87, 57, and 19.

27. Find the sum of 903,871 and 89,532.

28. Write the number that is 1,000 more than 329,990.

29. Write 2,291,620; 2,291,206; 2,921,260; and 2,291,026 from greatest to least.

30. Round 1,398,750 to the nearest hundred thousand.

31. Write the next 8 numbers for the count-by-6 pattern: 6, 12, 18, 24.

32. Use the following methods to estimate the sum of 158,341 and 211,977.
a. rounding to the greatest place
b. using front-end estimation

33. Explain why using front-end estimation for the addends 158,341 and 211,977 gives a more accurate estimate than rounding to the greatest place. Find the sum.

34. How do I know whether my answer is reasonable?

CHAPTER REVIEW

Write the number in standard form.

1. 49 billions, 307 millions, 4 thousands, 39 ones
2. sixteen million, one hundred forty thousand, ninety-two
3. thirteen and two hundred seven thousandths
4. fifty-seven and eleven hundredths
5. 500,000,000 + 30,000,000 + 200,000 + 10,000 + 9,000 + 40 + 6
6. 1,000,000,000 + 700,000,000 + 4,000,000 + 6,000 + 100 + 10 + 8

Write the number in expanded form.

7. 1,073,269
8. 4.987

Write the number in word form.

9. 17.38
10. 1,750

Write a comparison sentence by using >, <, or =.

11. 489 ___ 4.89
12. $\frac{16}{100}$ ___ 0.16
13. 1,989 ___ 2,000
14. 10 thousand ___ 10 million
15. 7 ___ -7
16. 21.065 ___ 21.603
17. -3 ___ 1
18. 1,000,000 ___ 947,502
19. 130,987 ___ one hundred thirteen thousand, nine hundred eighty-seven
20. 149,706,000 ___ 100,000,000 + 40,000,000 + 9,000,000 + 700,000 + 60,000

Write the numbers from least to greatest.

21.	400,906	400,096	400,960	400,690
22.	8.96	8.906	8.9	8.096
23.	17.038	17.08	17.308	17.083
24.	-4	-1	7	-12

Draw a number line to complete.

25. Label the endpoints 10 and 20. Draw a dot to show the approximate location of 15.
26. Label the endpoints 0 and 10. Draw a dot to show the approximate location of 7.5.
27. Label the endpoints -10 and 0. Draw a dot to show the approximate location of -4.
28. Label the endpoints 5,000 and 6,000. Draw a dot to show the approximate location of 5,800.

Round to the greatest place to estimate the sum or difference.

29. 67,380 + 5,274
30. 22,003 – 13,675
31. 36.2 – 18.375

Estimate the sum or difference by using front-end estimation.

32. 34,475 + 6,056 + 92,800
33. 802,000 – 317,876
34. 58.496 + 1.054

Solve.

35.
$$\begin{array}{r} 243{,}942 \\ 571{,}806 \\ +\ 209{,}999 \\ \hline \end{array}$$

36.
$$\begin{array}{r} \$417.49 \\ \$103.98 \\ +\ \$41.51 \\ \hline \end{array}$$

37.
$$\begin{array}{r} 500{,}000 \\ -\ 17{,}943 \\ \hline \end{array}$$

38.
$$\begin{array}{r} 49.039 \\ -\ 19.467 \\ \hline \end{array}$$

39. $^{-}3 + {}^{-}2$

40. $1 + {}^{-}4$

41. $0 + {}^{-}6$

42. $^{-}5 + 7$

Use an addition property to complete the equation.

43. $478 + 29 = \_\_ + 478$

44. $315 = \_\_ + 315$

45. $(81 + 71) + 60 = 81 + (\_\_ + 60)$

Find the answer.

46. Write the places in order from greatest to least.
hundred thousand
hundredth
million
tenth

47. Do numbers increase or decrease in value as you move right on a number line?

48. Solve $1{,}495 - 738 = \_\_$. Write an addition equation to check your answer.

49. Write 19, 53, 846, and 1,265 in Roman numerals.

50. Write two addition equations and two subtraction equations with 8, 12, and 20.

51. Round 11,564,298 to the nearest one million and the nearest ten thousand.

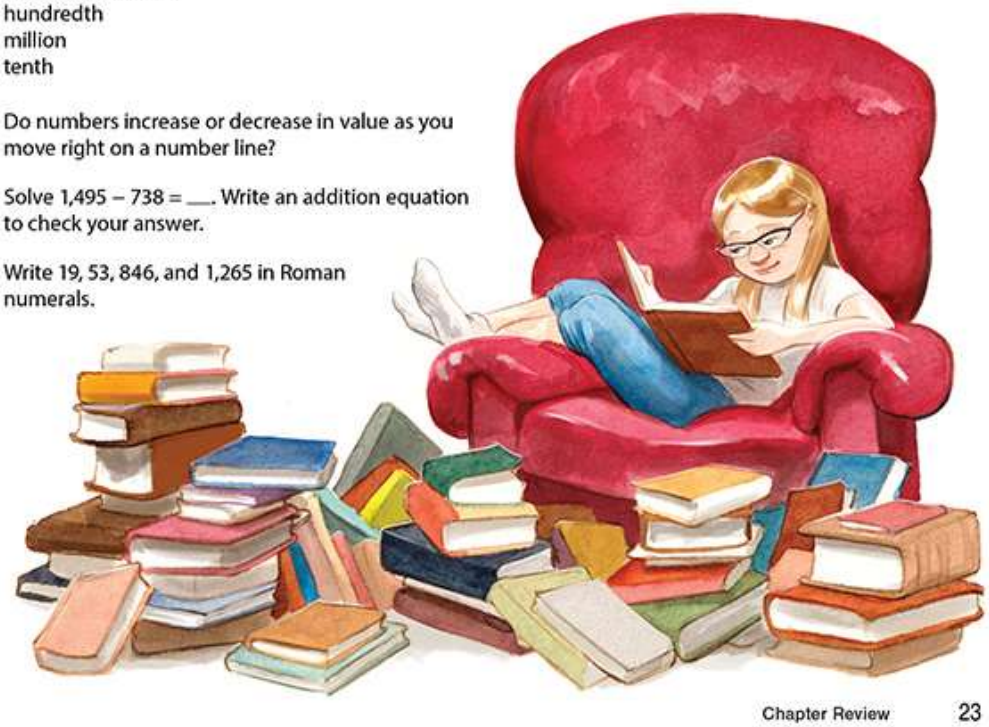
52. Draw a part-whole model for the equation $n + 6.84 = 19.05$. Solve.

53. Write 278,946,384 in expanded form and word form.

Solve.

54. Eric spends 10 min each night, Monday through Friday, reviewing his math facts. He spends 30 min each week reviewing his spelling words. How much review time does Eric spend each week reviewing math and spelling?

55. Kathleen read 3,922 pages for the summer reading program. She read 746 pages from mystery books, 1,347 pages from historical novels, and the rest from biographies. How many pages of biographies did Kathleen read?



CUMULATIVE REVIEW

Choose the answer.

1. $\begin{array}{r} 337 \\ +954 \\ \hline \end{array}$

A. 1,283
B. 1,291
C. 623

2. $\begin{array}{r} 590{,}006 \\ -357{,}324 \\ \hline \end{array}$

A. 231,692
B. 131,782
C. 232,682

3. $164 + n = 831$

A. $n = 667$
B. $n = 995$
C. $n = 7$

4. $3.7 + 4.52 =$ ___

A. 8.22
B. 489
C. 822

5. $57 \times 8 =$ ___

A. 406
B. 456
C. 449

6. $79 \times 10 =$ ___

A. 709
B. 790
C. 7,900

7. $8 \times n = 96$

A. $n = 44$
B. $n = 15$
C. $n = 12$

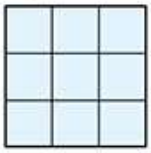
8. $37 \div 6 =$ ___

A. 21 r3
B. 5 r7
C. 6 r1

9. Find the perimeter.

A. 20 in.
B. 24 in.
C. 10 in.

10. Find the area (number of square units).



A. 6 ft^2
B. 12 ft^2
C. 9 ft^2

Choose the equation that fits the given description.

11. 43 students and 18 more students

A. $43 \times 18 = 774$

B. $43 + 18 = 61$

C. $43 - 18 = 25$

12. 27 packs of gum with 5 sticks in each pack

A. $27 \div 5 = 5$ r2

B. $27 \times 5 = 135$

C. $27 - 5 = 22$

13. 96 cookies distributed into packages of 12 cookies

A. $96 \div 12 = 8$

B. $96 \times 12 = 1{,}152$

C. $96 + 12 = 108$

14. 26 band members with 3 members out sick

A. $26 \div 3 = 8$ r2

B. $26 + 3 = 29$

C. $26 - 3 = 23$

15. 7 rows of 6 chairs

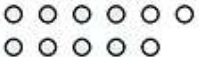
A. $56 \div 8 = 7$

B. $7 - 6 = 1$

C. $7 \times 6 = 42$

Choose the number represented by the model.

16.

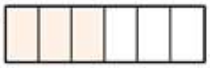


A. $\frac{8}{11}$

B. $\frac{2}{3}$

C. $\frac{1}{6}$

17.

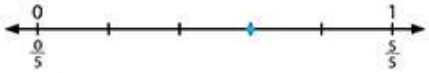


A. $\frac{5}{6}$

B. $\frac{3}{9}$

C. $\frac{1}{2}$

18.



A. $\frac{3}{5}$

B. $\frac{4}{7}$

C. $\frac{3}{4}$

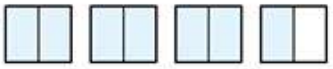
19.

A. $\frac{12}{6}$

B. $2\frac{1}{2}$

C. $\frac{5}{3}$

20.

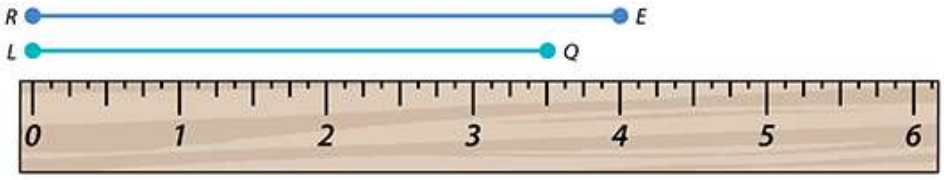


A. $\frac{7}{10}$

B. $3\frac{1}{2}$

C. $4\frac{1}{6}$

Choose the answer.



21. What is the length of $\overline{LQ}$?

A. $3\frac{1}{3}$ in.

B. $4\frac{1}{2}$ in.

C. $3\frac{1}{2}$ in.

22. What is the length of $\overline{RE}$?

A. $3\frac{3}{4}$ in.

B. 4 in.

C. 5 in.

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23. 80,000 + 7,000 + 300 + 20 + 5 = ___

A. 87,305

B. 87,325

C. 873.5

24. 600 + 30 + 2 + 0.5 = ___

A. 632.5

B. 6,325

C. 63.25

25. 643,872 + 10,000 = ___

A. 653,872

B. 743,872

C. 643,873