

13_a Place value

Lesson

A. Write each decimal.

10 and 6 tenths

31 hundredths

5 ten-thousandths

10.6

0.31 or .31

0.0005 or .0005

For decimals less than 1, sometimes a zero is written in ones place.

B. Give the place value of each 7.

millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones	tenths	hundredths	thousandths	ten-thousandths	hundred-thousandths	millionths
						2	0	0	0	7		
				7	4	6	0	3				
						8	2	7	4			
							0	0	0	0	1	7
					5	5	0	1	7	2		

ten-thousandths

hundreds

hundredths

millionths

thousandths

Write a decimal.

1. 4 and 8 hundredths

2. 32 hundredths

3. 6 millionths

4. 3 hundred-thousandths

5. 2 and 345 millionths

6. 76 and 406 thousandths

7. 302 and 5 tenths

8. 29 thousandths

Give the place value of each 3.

9. 245.1632

10. 82.38072

11. 13.024

12. 0.03

13. 0.465938

14. 88.8243

15. 300.5

16. 15.684913

14_a

Lesson

Comparing and ordering decimals

A. Is .46 equal to .460?

ones	tenths	hundredths	thousandths
	4	6	
	4	6	0

$$.46 = .460$$

B. Compare the numbers. Use $>$, $<$, or $=$.

$$2.53 \bigcirc 2.513$$

Remember, $>$ means "is greater than," and $<$ means "is less than."

Write the numbers with the same number of decimal places.

2.530 The ones and the tenths are the same.

2.513 Compare the hundredths. $3 > 1$

$$2.530 > 2.513$$

$$2.53 > 2.513$$

Draw a ring around the number that is *not* equal to the other numbers.

1. 5.590

(5.059)

5.59

2. .06

.0600

.006

3. 4.07

4.070

4.007

4. .7020

.720

.72

5. .80

.8

.08

6. 3.09

3.9

3.090

7. 2.510

2.51

2.051

8. .1583

.01583

.15830

Compare the decimals. Use $>$, $<$, or $=$.

9. .3 $\odot$.23

10. .5 $\bigcirc$.50

11. .10 $\bigcirc$.11

12. .7 $\bigcirc$.8

13. .55 $\bigcirc$.5

14. .7 $\bigcirc$.72

15. .7 $\bigcirc$.07

16. .08 $\bigcirc$.8

17. .811 $\bigcirc$.8111

18. .64321 $\bigcirc$.64311

19. 1.377 $\bigcirc$ 1.378

20. .00090 $\bigcirc$.001

For each exercise, write the decimals in order from least to greatest.

21. .79 .72 .80 .75

22. 3.226 3.220 3.224 3.222

23. .4 .04 .004 .0004

24. .0013 .0001 .013 .13

Lesson 15

Adding and subtracting decimals

A. Find $3.72 + 4 + 18.6$.

$$\begin{array}{r} 3.72 \\ 4.00 \\ + 18.60 \\ \hline \end{array}$$

Line up the decimal points and places. Put a decimal point in the answer.

$$\begin{array}{r} 11 \\ 3.72 \\ 4.00 \\ + 18.60 \\ \hline 26.32 \end{array}$$

Add as you do with whole numbers.

B. Find $50.2 - 17.96$.

$$\begin{array}{r} 50.20 \\ - 17.96 \\ \hline \end{array}$$

Line up the decimal points and places. Write a 0 after 50.2 so that you can subtract in the hundredths column. Put a decimal point in the answer.

$$\begin{array}{r} 9 \quad 11 \\ 4 \quad 10 \quad 12 \quad 10 \\ 50.20 \\ - 17.96 \\ \hline 32.24 \end{array}$$

Subtract as you do with whole numbers.

Add.

1. $\begin{array}{r} 103.8 \\ + 96.1 \\ \hline \end{array}$

2. $\begin{array}{r} 2.407 \\ + 18.291 \\ \hline \end{array}$

3. $\begin{array}{r} 13.2 \\ + 6.38 \\ \hline \end{array}$

4. $\begin{array}{r} 65.56 \\ + 5.6 \\ \hline \end{array}$

5. $216.4 + .137$

6. $.02 + 14.1$

7. $4.371 + 8.9$

8. $.6 + .09 + .7$

Subtract.

9. $\begin{array}{r} 15.84 \\ - 3.62 \\ \hline \end{array}$

10. $\begin{array}{r} 234.2 \\ - 120.7 \\ \hline \end{array}$

11. $\begin{array}{r} 47.5 \\ - 2.34 \\ \hline \end{array}$

12. $\begin{array}{r} 38.82 \\ - 14.961 \\ \hline \end{array}$

13. $89.07 - 41.58$

14. $52.7 - .13$

15. $.08 - .029$

16. $91 - 68.7$

Lesson 16_a Multiplying decimals

A. Find $.17 \times 36.1$.

To multiply decimals:

- multiply as you do with whole numbers;
- count the total number of decimal places in the numbers you are multiplying;
- begin at the right and count off the same number of decimal places in the answer.

$$\begin{array}{r} 36.1 \leftarrow 1 \text{ decimal place} \\ \times .17 \leftarrow 2 \text{ decimal places} \\ \hline 2527 \\ 3610 \\ \hline 6.137 \leftarrow 3 \text{ decimal places} \end{array}$$

B. Find 9×4.62 .

$$\begin{array}{r} 4.62 \leftarrow 2 \text{ decimal places} \\ \times 9 \leftarrow 0 \text{ decimal places} \\ \hline 41.58 \leftarrow 2 \text{ decimal places} \end{array}$$

C. Find $.08 \times 2.15$.

$$\begin{array}{r} 2.15 \leftarrow 2 \text{ decimal places} \\ \times .08 \leftarrow 2 \text{ decimal places} \\ \hline .1720 \leftarrow 4 \text{ decimal places} \end{array}$$

Write each answer with the decimal point in the correct position.

1. $\begin{array}{r} .7 \\ \times .7 \\ \hline 49 \end{array}$

.49

2. $\begin{array}{r} 3.6 \\ \times .2 \\ \hline 72 \end{array}$

3. $\begin{array}{r} 1.42 \\ \times .3 \\ \hline 426 \end{array}$

4. $\begin{array}{r} .64 \\ \times .5 \\ \hline 320 \end{array}$

5. $\begin{array}{r} 24.5 \\ \times .01 \\ \hline 245 \end{array}$

Multiply.

6. $\begin{array}{r} .17 \\ \times 3.2 \\ \hline \end{array}$

7. $\begin{array}{r} 5.1 \\ \times .15 \\ \hline \end{array}$

8. $\begin{array}{r} 6.12 \\ \times .21 \\ \hline \end{array}$

9. $\begin{array}{r} 2.83 \\ \times 1.5 \\ \hline \end{array}$

10. $\begin{array}{r} .184 \\ \times .66 \\ \hline \end{array}$

11. $4.7 \times .89$

12. $7.5 \times .31$

13. $.017 \times 32.5$

14. $5.1 \times .456$

15. 6.8×9.04

Lesson 17a

Multiplying decimals: zeros in the product

A. Find $.2 \times .3$.

$$\begin{array}{r} .3 \leftarrow 1 \text{ decimal place} \\ \times .2 \leftarrow 1 \text{ decimal place} \\ \hline .06 \leftarrow 2 \text{ decimal places} \end{array}$$

Here you need to write one zero
in the product (answer).

B. Find $.05 \times .025$.

$$\begin{array}{r} .025 \leftarrow 3 \text{ decimal places} \\ \times .05 \leftarrow 2 \text{ decimal places} \\ \hline .00125 \leftarrow 5 \text{ decimal places} \end{array}$$

Here you need to write two zeros
in the product.

When you multiply decimals, sometimes you need to write one or more
zeros in the product.

Multiply.

1. $\begin{array}{r} .08 \\ \times .8 \\ \hline \end{array}$

2. $\begin{array}{r} .12 \\ \times .3 \\ \hline \end{array}$

3. $\begin{array}{r} .11 \\ \times .9 \\ \hline \end{array}$

4. $\begin{array}{r} .6 \\ \times .1 \\ \hline \end{array}$

5. $\begin{array}{r} .15 \\ \times .05 \\ \hline \end{array}$

6. $\begin{array}{r} .112 \\ \times .3 \\ \hline \end{array}$

7. $\begin{array}{r} .25 \\ \times .04 \\ \hline \end{array}$

8. $\begin{array}{r} 1.13 \\ \times .05 \\ \hline \end{array}$

9. $\begin{array}{r} .09 \\ \times .9 \\ \hline \end{array}$

10. $\begin{array}{r} .07 \\ \times .7 \\ \hline \end{array}$

11. $\begin{array}{r} .019 \\ \times .4 \\ \hline \end{array}$

12. $\begin{array}{r} .66 \\ \times .02 \\ \hline \end{array}$

13. $\begin{array}{r} .006 \\ \times .12 \\ \hline \end{array}$

14. $\begin{array}{r} .77 \\ \times .023 \\ \hline \end{array}$

15. $\begin{array}{r} .818 \\ \times .05 \\ \hline \end{array}$

16. $.45 \times .096$

17. $.07 \times .136$

18. $.83 \times .011$

19. $.35 \times .14$

20. $.45 \times .078$

Lesson 18_a Multiplying decimals by 10, 100, or 1000

A. Multiply by 10.

$$\begin{aligned} 10 \times .461 &= 4.61 \\ 10 \times .3 &= 3 \\ 10 \times 9.05 &= 90.5 \end{aligned}$$

Move the decimal point one place to the right.

B. Multiply by 100.

$$\begin{aligned} 100 \times .461 &= 46.1 \\ 100 \times .3 &= 30 \\ 100 \times 9.05 &= 905 \end{aligned}$$

Move the decimal point two places to the right.

C. Multiply by 1000.

$$\begin{aligned} 1000 \times .461 &= 461 \\ 1000 \times .3 &= 300 \\ 1000 \times 9.05 &= 9050 \end{aligned}$$

Move the decimal point three places to the right.

Multiply.

1. 10×1.8 _____
2. $10 \times .23$ _____
3. 10×89.9 _____
4. $10 \times .465$ _____
5. 10×3.42 _____
6. $10 \times .06$ _____
7. $100 \times .45$ _____
8. 100×18.471 _____
9. 100×6.3 _____
10. $100 \times .092$ _____
11. 100×7.86 _____
12. $100 \times .2$ _____
13. 1000×8.7916 _____
14. 1000×24.63 _____
15. 1000×5.5 _____
16. $1000 \times .333$ _____
17. 1000×1.25 _____
18. 1000×16.4 _____

Draw a ring around the correct answer.

19. 100×8.4
84 840 8400
20. $10 \times .5$
5 50 500
21. 1000×8.63
863 8630 86,300
22. $10 \times .1$
1 10 100
23. 1000×2.5
25 250 2500
24. $100 \times .78$
78 780 7800
25. $1000 \times .04$
4 40 400
26. $100 \times .0009$
.009 .09 9
27. 10×3.008
30.08 300.8 3008

Lesson 19a

Dividing decimals by whole numbers

A. Find $17.65 \div 5$.

$$5 \overline{)17.65}$$

$$\begin{array}{r} 3.53 \\ 5 \overline{)17.65} \\ \underline{-15} \downarrow \\ 26 \downarrow \\ \underline{-25} \downarrow \\ 15 \downarrow \\ \underline{-15} \\ 0 \end{array}$$

Put a decimal point in the answer directly above the decimal point in the dividend, 17.65.

Then divide in the same way that you divide whole numbers.

B. Find $4.48 \div 32$.

$$32 \overline{)4.48}$$

Put a decimal point in the answer.

$$\begin{array}{r} .14 \\ 32 \overline{)4.48} \\ \underline{-32} \downarrow \\ 128 \downarrow \\ \underline{-128} \\ 0 \end{array}$$

Divide.

Divide.

1. $2 \overline{)17.3}$

2. $4 \overline{)2.96}$

3. $7 \overline{)1.47}$

4. $3 \overline{)2.13}$

5. $15 \overline{)43.5}$

6. $12 \overline{)5.04}$

7. $23 \overline{)370.3}$

8. $31 \overline{)77.5}$

9. $3.666 \div 6$

10. $57.5 \div 25$

11. $1.887 \div 17$

12. $437.9 \div 29$

Lesson 20_a Dividing by decimals

In division you can multiply the dividend and the divisor by the same number without changing the answer.

$$3 \overline{)12} \quad 30 \overline{)120} \quad 300 \overline{)1200}$$

A. Find $.45 \div .5$.

Multiply .45 and .5 by 10 to make the divisor, .5, a whole number.

$$5 \overline{)4.5}$$

To multiply by 10, move each decimal point one place to the right.

$$\begin{array}{r} .9 \\ 5 \overline{)4.5} \\ - 4.5 \\ \hline 0 \end{array}$$

Put a decimal point in the answer and divide 4.5 by 5.

B. Find $11.7 \div .18$.

Multiply 11.7 and .18 by 100 to make the divisor, .18, a whole number.

$$\begin{array}{r} 65. \\ 18 \overline{)1170} \\ - 108 \\ \hline 90 \\ - 90 \\ \hline 0 \end{array}$$

To multiply by 100, move each decimal point two places to the right.
Divide 1170 by 18.

Divide.

1. $5 \overline{)1.0}$

2. $6 \overline{)18.0}$

3. $.06 \overline{)1.284}$

4. $.3 \overline{)2.76}$

5. $.13 \overline{)2.6}$

6. $1.5 \overline{)3}$

7. $1.5 \overline{)7.5}$

8. $2.5 \overline{)62.5}$

9. $.2109 \div 1.9$

10. $.8379 \div .009$

11. $14.952 \div .042$

12. $1.245 \div 8.3$

Lesson 21a Dividing decimals: zeros in the quotient

A. Find $.0081 \div 9$.

$$\begin{array}{r} .00 \\ 9 \overline{) .0081} \end{array}$$

Write a decimal point
in the answer.
How many 9's in 0? 0
Write 0 above each 0
in the dividend.

$$\begin{array}{r} .000 \\ 9 \overline{) .0081} \end{array}$$

How many 9's in 8? 0
Write 0 above the 8
in the dividend.

$$\begin{array}{r} .0009 \\ 9 \overline{) .0081} \\ \underline{-81} \\ 0 \end{array}$$

How many 9's in 81? 9
Write 9 in the answer.

B. Find $16.2 \div .27$.

$$\begin{array}{r} .27 \overline{) 16.20} \end{array}$$

Multiply .27 and 16.2
by 100.

$$\begin{array}{r} 60. \\ .27 \overline{) 16.20} \\ \underline{-162} \\ 00 \\ \underline{-00} \\ 0 \end{array}$$

Write a decimal point
in the answer.
Divide.

When you divide decimals, you sometimes have to write one or more zeros
in the quotient (answer).

Draw a ring around the correct answer.

1. $.04 \div .8$
.005 .05 50

2. $.063 \div 7$
.9 .09 .009

3. $.0252 \div .36$
.7 .07 .007

Divide.

4. $.3 \overline{) .015}$

5. $.07 \overline{) .1407}$

6. $2 \overline{) .0202}$

7. $.06 \overline{) 4.32}$

8. $.5 \overline{) .010}$

9. $44 \overline{) .2508}$

10. $1.8 \overline{) 5.472}$

11. $.12 \overline{) 9.6}$

22_a Dividing decimals by 10, 100, or 1000

Lesson

A. Divide by 10.

$$\begin{aligned} 384.2 \div 10 &= 38.42 \\ 5.27 \div 10 &= .527 \\ .03 \div 10 &= .003 \\ 7 \div 10 &= .7 \end{aligned}$$

Move the decimal point in the dividend one place to the left.

B. Divide by 100.

$$\begin{aligned} 384.2 \div 100 &= 3.842 \\ 5.27 \div 100 &= .0527 \\ .03 \div 100 &= .0003 \\ 7 \div 100 &= .07 \end{aligned}$$

Move the decimal point in the dividend two places to the left.

C. Divide by 1000.

$$\begin{aligned} 384.2 \div 1000 &= .3842 \\ 5.27 \div 1000 &= .00527 \\ .03 \div 1000 &= .00003 \\ 7 \div 1000 &= .007 \end{aligned}$$

Move the decimal point in the dividend three places to the left.

Divide each number by 10.

1. 9.746 _____

2. 246.8 _____

3. .062 _____

Divide each number by 100.

4. .25 _____

5. 4.683 _____

6. .034 _____

Divide each number by 1000.

7. 1210.5 _____

8. 339.6 _____

9. .08 _____

Draw a ring around the correct answer.

10. $1 \div 1000$
.01 .001 .0001

11. $3.64 \div 100$
364 .364 .0364

12. $.2 \div 10$
.02 .002 .0002

13. $.51 \div 100$
5.1 .0051 .051

14. $.038 \div 1000$
.38 .0038 .000038

15. $9.04 \div 10$
.0904 .904 90.4

16. $4 \div 100$
.4 .004 .04

17. $.003 \div 10$
.03 .0003 .00003

18. $26 \div 1000$
.026 .26 2.6

Lesson 23^a Rounding decimals

Round each decimal.

	Nearest tenth ↓	Nearest hundredth ↓	Nearest thousandth ↓
Decimal	3.0785	3.0785	3.0785
Rounded decimal	3.1	3.08	3.079

Point to the digit in the place to which you are rounding. If the next digit to the right (the key digit) is 5 or greater, add 1 to the digit you are pointing to. Drop the other digits to the right.

	↓	↓	↓
Decimal	6.1302	6.1302	6.1302
Rounded decimal	6.1	6.13	6.130

If the next digit to the right (the key digit) is less than 5, do *not* change the digit you are pointing to. Drop the other digits to the right.

Round to the nearest tenth.

1. .13

2. 3.98

3. 15.19

4. 2.354

.1

4.0

5. .08

6. .458

7. 28.218

8. .067

Round to the nearest hundredth.

9. 1.421

10. 17.5553

11. .0318

12. 2.796

Round to the nearest thousandth.

13. 8.3872

14. .0009

15. 18.3645

16. 4.6977

Lesson 24a Rounding quotients

A. Find $.359 \div .2$. Round your answer to the nearest tenth.

Divide until the quotient is in hundredths. Then round to the nearest tenth.

$$\begin{array}{r} 1.79 \rightarrow 1.8 \\ 2 \overline{) 3.59} \\ \underline{-2} \\ 15 \\ \underline{-14} \\ 19 \\ \underline{-18} \\ 1 \end{array}$$

B. Find $6.183 \div 4.2$. Round your answer to the nearest thousandth.

Divide until the quotient is in ten-thousandths (4 places). Then round to the nearest thousandth.

$$\begin{array}{r} 1.4721 \rightarrow 1.472 \\ 4.2 \overline{) 6.18300} \\ \underline{-4} \\ 198 \\ \underline{-168} \\ 303 \\ \underline{-294} \\ 90 \\ \underline{-84} \\ 60 \\ \underline{-42} \\ 18 \end{array}$$

You must write zeros until there are four places after the decimal point in 61.83.

Divide.

Round the answer to the nearest tenth.

1. $7 \overline{) 5.55}$

2. $.3 \overline{) 1.29}$

3. $.5 \overline{) 4.375}$

4. $1.2 \overline{) 8.592}$

Round the answer to the nearest hundredth.

5. $.4 \overline{) 0.672}$

6. $1.5 \overline{) 7.5975}$

7. $.3 \overline{) 3.267}$

8. $.25 \overline{) 0.0105}$

Round the answer to the nearest thousandth.

9. $.5 \overline{) 0.01745}$

10. $11 \overline{) 150}$