

Multiplying and Dividing Decimals

Goal: Multiply and divide decimals.

Vocabulary

Leading digit: The leftmost nonzero digit in a number

Multiplying Decimals

Words Multiply decimals as you do whole numbers. Then place the decimal point. The number of decimal places in the product is the total number of decimal places in the **factors**.

Numbers	3.16	×	8.7	=	27.492
	└─┘		└─┘		└─┘
	2 places		1 place		3 places

EXAMPLE 1 Multiplying Decimals

Deli You buy 1.5 pounds of lunchmeat that costs \$4.98 per pound. How much do you pay for the lunchmeat?

Solution

To find how much you pay for the lunchmeat, multiply the cost per pound by the number of pounds.

4.98	×	1.5	+ 2 decimal place(s)
2490			+ 1 decimal place(s)
498			
7.470			3 decimal place(s)

Hint:
Use unit analysis to check the units of your answer.

Remember that you don't need to write the zero in the thousandths' place in your answer.

Answer: You pay **\$7.47** for the lunchmeat.

Guided Practice Multiply. Check that your answer is reasonable.

1. $-8.62 \cdot 2.3$

2. $15.01 \cdot (-4.95)$

3. $1.21 \cdot 0.07$

To check that a product is reasonable, round each factor to its leading digit and multiply.

Dividing Decimals

Words When you divide by a decimal, multiply both the divisor and the dividend by the power of **ten** that will make the **divisor** an integer. Then divide.

Numbers $3.25 \overline{)15.925}$

Multiply by **100**.

$325 \overline{)1592.5}$ ^{4.9}

EXAMPLE 2 Dividing Decimals

To find the quotient $27.048 \div 2.8$, multiply the divisor and dividend by **10**. Move the decimal points **1** place to the right.

$2.8 \overline{)27.048}$

Move decimal points.

$28 \overline{)270.48}$

Then divide.

	9.66
28	<u>270.48</u>
	252
	184
	<u>168</u>
	168
	<u>168</u>
	0

✓ **Check** To check that the quotient is reasonable, round the quotient and the divisor to the leading digit. Then multiply. The result should be close in value to the dividend.

9.66 $\cdot 2.8$

Round. **10** \cdot **3** = **30** ✓

EXAMPLE 3 Using Zeros as Placeholders

To find some quotients, you may need to use zeros as placeholders.

Placeholder in Dividend

$$12 \div 1.5$$

$$1.5 \overline{)12.0}$$

8
15 $\overline{)120}$
120
0

Zero as placeholder

Placeholder in Quotient

$$0.00519 \div 1.73$$

$$1.73 \overline{)0.00519}$$

0.003
173 $\overline{)0.519}$
519
0

Remember to use zeros as placeholders.

Guided Practice Find the quotient. Check that your answer is reasonable.

4. $5.6 \div 0.07$	5. $0.792 \div 0.88$	6. $15 \div 0.25$
7. $2.496 \div 6.4$	8. $1.5759 \div 3.09$	9. $0.0188 \div 9.4$

EXAMPLE 4 Multiplying and Dividing with Negative Decimals

a. $-5.3 \times (-1.2)$

The decimals have the same sign, so the

product is **positive**.

$$\begin{array}{r} -5.3 \\ \times -1.2 \\ \hline \end{array}$$

106

53

6.36

b. $3.77 \div (-1.16)$

The decimals have different signs, so the

quotient is **negative**.

$$\begin{array}{r} -3.25 \\ -116 \overline{)377.00} \\ \underline{348} \\ 290 \\ \underline{232} \\ 580 \\ \underline{580} \\ 0 \end{array}$$

Guided Practice Find the product or quotient. Check that the answer is reasonable.

10. $-6.8 \times (-3.1)$

11. -5.5×0.32

12. $11.96 \div (-1.3)$

13. $-3.22 \div (-2.8)$

Homework