

Estimating Products and Quotients



Quick Review

- Here are 2 strategies you can use to estimate 5.81×7 .

• **Front-end estimation**

Write 5.81 as 5.

Multiply: $5 \times 7 = 35$

This is an underestimate because 5 is less than 5.81.

• **Decimal benchmarks**

Since 5.81 is closer to 6 than to 5, write 5.81 as 6.

Multiply: $6 \times 7 = 42$

This is an overestimate because 6 is greater than 5.81.

- Here are 2 strategies you can use to estimate $284.76 \div 5$.

• **Front-end estimation**

Write 284.76 as 200.

Divide: $200 \div 5 = 40$

This is an underestimate because 200 is less than 284.76.

• **Compatible numbers**

Since 284.76 is close to 300,

divide: $300 \div 5 = 60$

This is an overestimate because 300 is greater than 284.76.

Try These

1. Estimate each product. Show your work.

a) 5.23×7 _____ b) 25.783×4 _____

c) 9.96×4 _____ d) 6.7×7 _____

2. Estimate each quotient. Show your work.

a) $15.9 \div 8$ _____ b) $18.12 \div 2$ _____

c) $42.035 \div 6$ _____ d) $159.4 \div 8$ _____

3. Estimate the area of a 3.68-cm-by-8-cm rectangle. _____

4. Estimate the side length of a square with perimeter:

a) 24.8 m _____ b) 29.0 m _____

Multiplying Decimals by a Whole Number



Quick Review

You can use what you know about multiplying whole numbers to multiply a decimal by a whole number.

Multiply: 2.936×4

- First estimate.

Since 2.936 is closer to 3 than to 2, write 2.936 as 3.

Multiply: $3 \times 4 = 12$

So, 2.936×4 is about 12.

- Record the numbers without the decimal point.

Multiply as you would with whole numbers.

- Use the estimate to place the decimal point in the product.

11.744 is close to 12, so

2.936×4 is 11.744.

$$\begin{array}{r}
 2936 \\
 \times 4 \\
 \hline
 24 \\
 120 \\
 3600 \\
 8000 \\
 \hline
 11744
 \end{array}$$

Try These

Multiply.

1. a) 5.18
 $\times 5$

b) 1.734
 $\times 8$

c) 0.143
 $\times 4$

d) 9.431
 $\times 2$

Multiplying a Decimal Less than 1 by a Whole Number



Quick Review

When you multiply a decimal less than 1 by a whole number, the product is less than the whole number.

- To multiply 0.0295 by 7, multiply the whole numbers: 295×7

$$\begin{array}{r} 295 \\ \times 7 \\ \hline 35 \end{array}$$

Estimate to place the decimal point:

0.0295 is close to 0.03, or 3 hundredths.

3 hundredths multiplied by 7 is 21 hundredths.

21 hundredths are close to 20 hundredths, or 2 tenths.

Place the decimal point so the product is close to 2 tenths: 0.2065

So, $0.0295 \times 7 = 0.2065$

$$\begin{array}{r} 630 \\ 1400 \\ \hline 2065 \end{array}$$

Try These

1. Multiply.

a) $0.7 \times 5 = \underline{\hspace{2cm}}$ b) $0.25 \times 3 = \underline{\hspace{2cm}}$ c) $0.12 \times 5 = \underline{\hspace{2cm}}$

2. Multiply as you would whole numbers. Estimate to place the decimal point.

a) 0.467×8 b) 0.086×9 c) 0.7634×7

3. Multiply.

a) $0.7 \times 4 \underline{\hspace{2cm}}$ b) $0.35 \times 6 \underline{\hspace{2cm}}$

$0.07 \times 4 \underline{\hspace{2cm}}$ $0.035 \times 6 \underline{\hspace{2cm}}$

$0.007 \times 4 \underline{\hspace{2cm}}$ $0.0035 \times 6 \underline{\hspace{2cm}}$

Dividing Decimals by a Whole Number

Quick Review

Here is one way to divide a decimal by a whole number.

Divide: $7.938 \div 2$

- Record the numbers without the decimal point.

Divide as you would with whole numbers.

- Estimate to place the decimal point.

7.938 is close to 8 .

$8 \div 2$ is 4 .

The answer must be a little less than 4 .

So, $7.938 \div 2 = 3.969$

- Check by multiplying:

$3.969 \times 2 = 7.938$

So, the answer is correct.

$$\begin{array}{r}
 3969 \\
 2 \overline{) 7938} \\
 \underline{- 6} \\
 19 \\
 \underline{- 18} \\
 13 \\
 \underline{- 12} \\
 18 \\
 \underline{- 18} \\
 0
 \end{array}$$



Try These

1. Divide.

a) $0.924 \div 3$

b) $5.138 \div 2$

c) $3.045 \div 5$

d) $7.896 \div 4$

Dividing a Decimal Less than 1 by a Whole Number



Quick Review

Divide: $0.086 \div 5$

► Estimate.

0.086 is close to 0.085.

0.085 is 85 thousandths.

Eighty-five thousandths divided

by 5 is 17 thousandths.

So, $0.086 \div 5$ is about 0.017.

► Calculate.

$$\begin{array}{r}
 00172 \\
 5 \overline{)0.0860} \\
 \underline{-5} \\
 36 \\
 \underline{-35} \\
 10 \\
 \underline{-10} \\
 0
 \end{array}$$

So, $0.086 \div 5 = 0.0172$

Since 0.0172 is close to the estimate, 0.017, the answer is reasonable.

Try These

1. Divide.

a)

$$2 \overline{)0.0370}$$

b)

$$4 \overline{)0.36}$$

c)

$$5 \overline{)0.00740}$$

d)

$$3 \overline{)0.369}$$

4. Divide.

a) $452 \div 10 =$ _____

$452 \div 100 =$ _____

$452 \div 1000 =$ _____

b) $89.12 \div 10 =$ _____

$89.12 \div 100 =$ _____

$89.12 \div 1000 =$ _____

Describe any patterns you see.

5. Divide.

a) $452 \div 0.1 =$ _____

$452 \div 0.01 =$ _____

$452 \div 0.001 =$ _____

b) $89.12 \div 0.1 =$ _____

$89.12 \div 0.01 =$ _____

$89.12 \div 0.001 =$ _____

Describe any patterns you see.

6. Divide. Estimate to place the decimal point.

a) $3.9 \div 0.6$

$3.9 \div 0.6$ is about: _____

So, $3.9 \div 0.6 =$ _____

c) $8.51 \div 0.2$

$8.51 \div 0.2$ is about: _____

So, $8.51 \div 0.2 =$ _____

b) $6.2 \div 0.8$

$6.2 \div 0.8$ is about: _____

So, $6.2 \div 0.8 =$ _____

d) $6.7 \div 0.5$

$6.7 \div 0.5$ is about: _____

$6.7 \div 0.5 =$ _____

7. A case of soup is on sale for \$18.63.

There are 27 cans in a case.

What is the cost of each can of soup? _____