Decimals

3-2 Adding and Subtracting Decimals

Learn to add and subtract decimals.

3-2 Adding and Subtracting Decimals

$$\begin{array}{r} 66.8 \\ +\ 4.0 \\ \hline 70.8 \end{array}$$

Use zero as a placeholder so that both numbers have the same number of digits after their decimal points.

Add each column just as you would add integers.

Line up the decimal points.

Additional Example 1A: Adding Decimals

Add. Estimate to check whether each answer is is reasonable.

4.55 + 11.3

$$\begin{array}{r} 4.55 \\ +\ 11.30 \\ \hline 15.85 \end{array}$$

Line up the decimal points.

Use zero as a placeholder.

Add.

Estimate

5 + 11 = 16

15.85 is a reasonable answer.

Additional Example 1C: Adding Decimals

Add. Estimate to check whether each answer is reasonable.

−8.33 + (−10.972)

−8.33 + (−10.972)

Think: 8.33 + 10.972.

$$\begin{array}{r} 8.330 \\ +10.972 \\ \hline 19.302 \end{array}$$

Line up the decimal points. Use zero as a placeholder. Add.

−8.33 + (−10.972) = −19.302

Use the sign of the two numbers.

Estimate

−8 + (−11) = −19

−19.302 is a reasonable answer.

Check It Out: Example 1B

Add. Estimate to check whether each answer is is reasonable.

4.21 + (-34)

-34.00
+ 4.21

- 29.79

Line up the decimal points.

Use zeros as placeholders.

Different signs Subtract. Take sign of larger #

Additional Example 2: Subtracting Decimals

Subtract.

A. 5.34 − 2.08

$$\begin{array}{r} 5.34 \\ -2.08 \\ \hline 3.26 \end{array}$$

Line up the decimal points.

Subtract.

B. 28 − 15.911

$$\begin{array}{r} 7\ 9\ 9\ 10 \\ 28.\cancel{000} \\ -15.911 \\ \hline 12.089 \end{array}$$

Use zeros as placeholders.

Line up the decimal points.

Subtract.

Check It Out: Example 2

Subtract.

A. 3.57 − 1.46

$$\begin{array}{r} 3.57 \\ -1.46 \\ \hline 2.11 \end{array}$$

Line up the decimal points.

Subtract.

B. 34 − 12.462

$$\begin{array}{r} {\scriptstyle 3\ 9\ 9\ 10} \\ 34.\cancel{000} \\ -12.462 \\ \hline 21.538 \end{array}$$

Use zeros as placeholders.

Line up the decimal points.

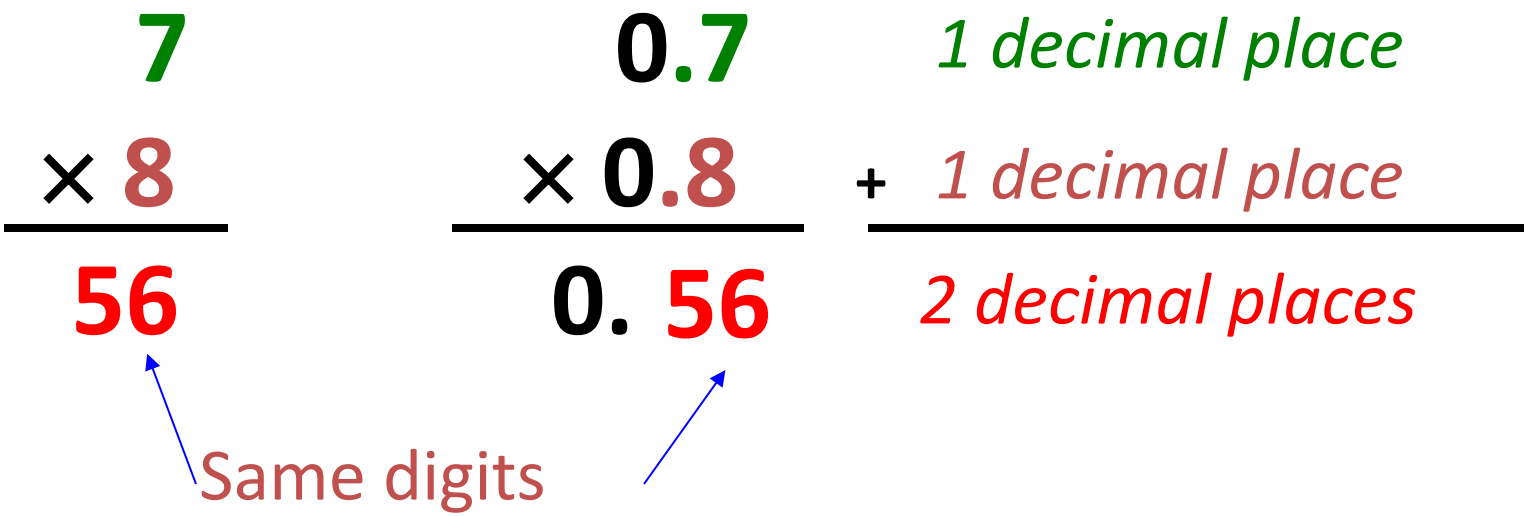
Subtract.

3-3 Multiplying Decimals

Learn to multiply decimals.

3-3 Multiplying Decimals

To multiply decimals, multiply as you would with integers. To place the decimal point in the product, count the number of decimal places in each factor. The product should have the same number of decimal places in the factors.



Additional Example 1: Multiplying Integers by Decimals

Multiply.

A. $7 \cdot 0.1$

$$\begin{array}{r} 7 \\ \times\ 0.1 \\ \hline 0.7 \end{array}$$

0 decimal places

1 decimal place

0 + 1 = 1 decimal place

B. $-3 \cdot 0.03$

$$\begin{array}{r} -3 \\ \times\ 0.03 \\ \hline -0.09 \end{array}$$

0 decimal places

2 decimal places

0 + 2 = 2 decimal places. Use zero as a place holder.

Check It Out: Example 1

Multiply.

A. 8 · 0.3

$$\begin{array}{r} 8 \\ \times\ 0.3 \\ \hline 2.4 \end{array}$$

0 decimal places

1 decimal place

0 + 1 = 1 decimal place

B. –2 · 0.04

$$\begin{array}{r} -2 \\ \times\ 0.04 \\ \hline -0.08 \end{array}$$

0 decimal places

2 decimal places

0 + 2 = 2 decimal places. Use zero as a place holder.

Additional Example 2B: Multiplying Decimals by Decimals

Multiply. Estimate to check whether each answer is reasonable.

$-3.84 \cdot 0.9$

-3.84 — *2 decimal places*

$\times\ 0.9$ — *1 decimal place*

-3.456 — *2 + 1 = 3 decimal places*

Estimate

$-4 \cdot 1 = -4$ — *–3.456 is a reasonable answer.*

Turn to page 26 in your workbook

Complete the following problems:
13, #14, and # 15

If you are done early – work on problems 1-12

3-4 Dividing Decimals by Integers

Learn to divide decimals by integers.

Additional Example 1A: Dividing Decimals by Integers

Divide. Estimate to check whether each answer is reasonable.

36.75 ÷ 7

```
      5.25
7 ) 36.75
   −35
     1 7
    −14
       3 5
      −35
         0
```

Place the decimal point for the answer directly above the decimal under the division symbol.

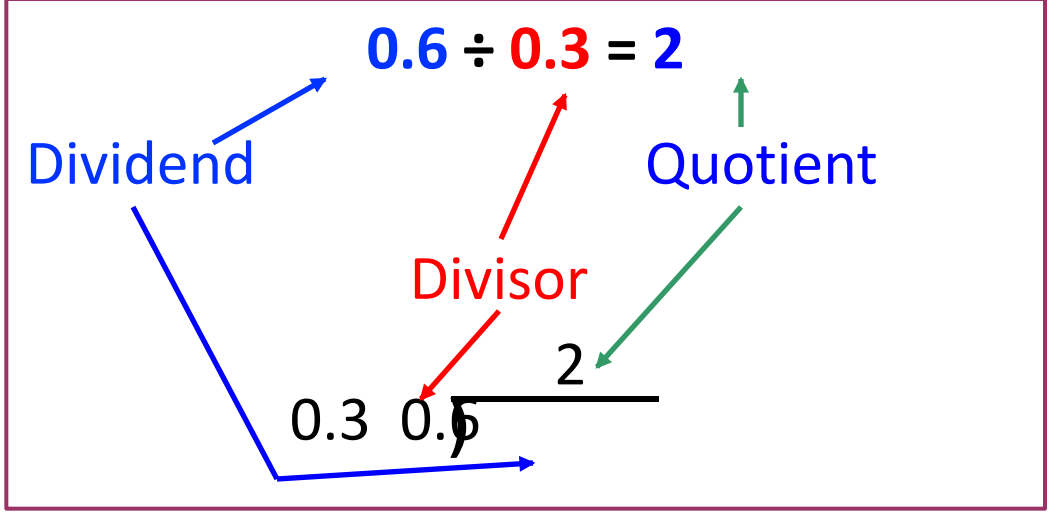
Divide as with whole numbers.

Estimate

35 ÷ 7 = 5

5.25 is a reasonable answer.

Remember!



Additional Example 1B: Dividing Decimals by Integers

Divide. Estimate to check whether each answer is reasonable.

0.87 ÷ 3

$$
\begin{array}{r}
0.29 \\
3\overline{)\,0.87} \\
-6 \\
\hline
27 \\
-27 \\
\hline
0
\end{array}
$$

Place the decimal point for the answer directly above the decimal under the division symbol. Add a zero as a placeholder in the answer.

Divide as with whole numbers.

Estimate

0.9 ÷ 3 = 0.3

0.29 is a reasonable answer.

Additional Example 1C: Dividing Decimals by Integers

Divide. Estimate to check whether each answer is reasonable.

82.08 ÷ (–27)

```
        3 .0 4
27 ) 82.08
    –81
      1 0
       –0
      1 08
     –108
         0
```

The signs are different.

Think: 82.08 ÷ 27.

Place the decimal point for the answer directly above the decimal under the division symbol.

82.08 ÷ (–27) = –3.04

Estimate

90 ÷ –30 = –3

The answer is reasonable.

Check It Out: Example 1C

Divide. Estimate to check whether each answer is reasonable.

65.16 ÷ (–12)

```
      5 .4 3
12 ) 65.16
    –60
     5 1
    –48
      36
     –36
       0
```

The signs are different.

Think: 65.16 ÷ 12

Place the decimal point for the answer directly above the decimal under the division symbol.

65.16 ÷ (–12) = –5.43

Estimate

60 ÷ –12 = –5

The answer is reasonable.

Turn to page 27
Complete #14, 15, 16