

DECIMAL MODULE

I. Adding Decimals

II. Subtracting Decimals

III. Multiplying Decimals

IV. Dividing Decimals

I. Adding Decimals.

Introduction: This is the first of four parts on working with decimals. You're going to look at an example on how to add decimals. Afterwards, you're going to try to do some problems on your own. There will be 20 problems for you to practice. After you're successful in doing the practice problems, try the short quiz. The answers can be found at the end of each section.

A) Example: Add $59 + 1.345 + 0.28$

Step 1: Write the numbers vertically and line up the decimal points. A whole number can be written as a decimal by placing a decimal point at the end of the number such as $59 = 59.$ Then add zeros after decimal point to each number so that all numbers have the same number of decimal places.

$$\begin{array}{r} 59.000 \\ 1.345 \\ + \underline{0.280} \end{array} \quad \begin{array}{l} \longrightarrow \text{ add decimal point and three zeros} \\ \longrightarrow \text{ add one zero} \end{array}$$

Step 2: Add 5 to 0 giving 5. Write 5 in the thousandths place.

$$\begin{array}{r} 59.000 \\ 1.345 \\ + \underline{0.280} \\ 5 \end{array}$$

Step 3: Add 4 to 8 giving 12. Write 2 in the hundredths place and carry 1.

$$\begin{array}{r} 1 \\ 59.000 \\ 1.345 \\ + \underline{0.280} \\ 25 \end{array} \quad \longrightarrow \text{ carried 1 from 12}$$

Step 4: Add carried 1 to 3 and 2 giving 6. Write 6 in the tenths place. Bring down the decimal point.

$$\begin{array}{r} 59.000 \\ 1.345 \\ + \underline{0.280} \\ .625 \end{array}$$

Step 5: Add 9 to 1 giving 10. Write 0 in the ones place and carry 1.

$$\begin{array}{r} 1 \\ 59.000 \\ 1.345 \\ + \underline{0.280} \\ 0.625 \end{array} \quad \longrightarrow \text{ carried 1 from 10}$$

Step 6: Add 1 to 5 giving 6. Write 6 in the tens place.

$$\begin{array}{r} 59.000 \\ 1.345 \\ + \underline{0.280} \\ \hline 60.625 \end{array} \longrightarrow \text{this is the final answer}$$

B) You Try.

Add: a) $59 + 1.27 + 0.345$

b) $35.4 + 0.8759$

Answers to B "You Try":

a) 60.615

b) 36.2759

C) Practice Problems.

Do the following addition problems:

1) $79.40 + 42.261$

2) $98.53 + 26.610$

3) $65.60 + 13.978$

4) $76.2 + 60.5$

5) $37.28 + 24.1$

6) $40.05 + 32.18$

7) $81.637 + 73.449$

8) $54.85 + 21.165$

9) $93.39 + 47.783$

10) $40.006 + 8.9$

11) $34.657 + 18.186$

12) $77.77 + 36.1$

13) $85.71 + 65.102$

14) $71.775 + 32.965$

15) $16.2 + 9.044$

16) $81.21 + 57.890$

17) $56.5 + 40.04$

18) $58.742 + 56.84$

19) $55.033 + 45.05$

20) $72.20 + 58.000$

Answers to C "Practice Problems": 1) 121.661; 2) 125.14; 3) 79.578; 4) 136.7; 5) 61.38; 6) 72.23; 7) 155.086; 8) 79.015; 9) 141.173; 10) 48.906; 11) 52.843; 12) 113.87; 13) 150.812; 14) 104.74; 15) 25.244; 16) 139.1; 17) 96.54; 18) 115.582; 19) 100.083; 20) 135.2

D) Quiz. Add:

1) $67.3 + 48.24$

2) $49.577 + 34.995$

3) $36.226 + 16.097$

4) $81.1 + 24.2$

5) $82.1 + 27.95$

Answers to D "Quiz": 1) 115.54; 2) 84.572; 3) 52.323; 4) 105.3; 5) 110.05

II. Subtracting Decimals.

Introduction: This is the second of four parts on working with decimals. You're going to look at an example on how to subtract decimals. Afterwards, you're going to try to do some problems on your own. There will be 20 problems for you to practice. After you're successful in doing the practice problems, try the short quiz. The answers can be found at the end of each section.

A) **Example:** Subtract $38.72 - 9.761$

Step 1: Write the numbers vertically and line up the decimal points. Then add zero to each number so that all numbers have the same number of decimal places.

$$\begin{array}{r} 38.720 \\ - 9.761 \\ \hline \end{array} \longrightarrow \text{add one zero}$$

Step 2: Borrow 1 hundredth from 2 hundredths by crossing out the 2 and placing the 1 above the 2. Then cross out the 0 and place the 10 above the 0. Subtract 1 from 10 giving 9. Write 9 in the thousandths place.

$$\begin{array}{r} 1\ 10 \\ 38.7\cancel{2}0 \\ - 9.761 \\ \hline 9 \end{array}$$

Step 3: Borrow 1 tenth from 7 tenths by crossing out the 7 and placing the 6 above the 7. Then cross out the 1 and place the 11 above the 1. Subtract 5 from 11 giving 5. Write 5 in the hundredths place.

$$\begin{array}{r} 11 \\ 6\cancel{1} \\ 38.7\cancel{2}0 \\ - 9.761 \\ \hline 59 \end{array}$$

Step 4: Borrow 1 one from 8 ones by crossing out the 8 and placing the 7 above the 8. Then cross out the 6 and place the 16 above the 6. Subtract 7 from 16 giving 9. Write 9 in the tenths place and bring down the decimal point.

$$\begin{array}{r} 16 \\ 7\cancel{6} \\ 38.7\cancel{2}0 \\ - 9.761 \\ \hline .959 \end{array}$$

Step 5: Borrow 1 ten from 3 tens by crossing out the 3 and placing the 2 above the 3. Then cross out the 8 and place the 7 above the 8. Then cross out the 7 and write 17 above the 7. Subtract 8 from 17 giving 8. Write 8 in the tenths place and bring down the 2.

$$\begin{array}{r}
 17 \\
 2 \cancel{7} \\
 3 \cancel{8} . \cancel{7} \cancel{2} 0 \\
 - 8 . 7 \cancel{6} \cancel{1} \\
 \hline
 2 \mathbf{8} . \mathbf{9} \mathbf{5} \mathbf{9}
 \end{array}
 \longrightarrow \text{this is the final answer}$$

B) You Try:

Subtract: a) $25.3 - 4.958$ b) $84.375 - 38.52$

Answers to B "You Try": a) 20.342 b) 46.23

C) Practice Problems.

Do the following subtraction problems:

1) $87.375 - 61.9$ 2) $90.09 - 82.078$ 3) $78.688 - 72.02$

4) $55 - 40.8$ 5) $34.776 - 24.7$ 6) $67.984 - 38.66$

7) $68 - 5.0$ 8) $76.3 - 50.132$ 9) $73.070 - 16.05$

10) $82.062 - 76.828$ 11) $77.036 - 47.716$ 12) $97.41 - 60.3$

13) $75 - 66.48$ 14) $87.07 - 54.2$ 15) $82.09 - 16.961$

16) $46.9 - 42.4$ 17) $52.403 - 23.141$ 18) $63.9 - 10.879$

19) $26.67 - 18.14$ 20) $73.91 - 23.87$

Answers to C “Practice Problems”: 1) 25.623; 28.012; 3) 6.668; 4) 14.2; 5) 10.076; 6) 29.324; 7) 63; 8) 26.168; 9) 57.02; 10) 5.234; 11) 29.32; 12) 37.11; 13) 8.52; 14) 32.87; 15) 65.129; 16) 4.5; 17) 29.262; 18) 53.021; 19) 8.53; 20) 50.04

D) Quiz.

Subtract: 1) $43.5 - 15$ 2) $31.9 - 26.197$

3) $85.1 - 60.299$ 4) $27.01 - 24.7$ 5) $60.5 - 46.1$

Answers to D “Quiz”: 1) 8.5; 2) 5.703; 3) 24.801; 4) 2.31; 5) 14.4

III. Multiplying Decimals.

Introduction: This is the third of four parts on working with decimals. You're going to look at an example on how to multiply decimals. Afterwards, you're going to try to do some problems on your own. There will be 20 problems for you to practice. After you're successful in doing the practice problems, try the short quiz. The answers can be found at the end of each section.

A) Example: Multiply 7.5×3.9

Step 1: Write the numbers vertically and multiply them as if there were no decimal point.

$$\begin{array}{r} 7.5 \\ \times 3.9 \\ \hline \end{array}$$

Step 2: 9 times 5 equals 45. Write 5 in the ones place and carry 4.

$$\begin{array}{r} 4 \quad \longrightarrow \text{carried 4 from 45} \\ 7.5 \\ \times 3.9 \\ \hline 5 \end{array}$$

Step 3: 9 times 7 equals 63. Add 63 to the carried 4 giving 67. Write 7 in the tens place and 6 in the hundreds place.

$$\begin{array}{r} 4 \\ 7.5 \\ \times 3.9 \\ \hline 675 \end{array}$$

Step 4: Write 0 below the 5 as a place holder. Then repeat steps 2 and 3 for multiplying 3 by 75. Multiply 3 by 5 giving 15. Write 5 below 7 and carry 1.

$$\begin{array}{r} 1 \quad \longrightarrow \text{carried 1 from 15} \\ 7.5 \\ \times 3.9 \\ \hline 675 \\ 50 \quad \longrightarrow \text{add zero as a place holder} \end{array}$$

Step 5: 3 times 7 equals 21. Add 21 to the carried 1 giving 22. Write 2 in the hundreds place and 2 in the thousands place.

$$\begin{array}{r} 1 \\ 7.5 \\ \times 3.9 \\ \hline 675 \quad (9 \times 75 = 675) \\ \underline{2250} \quad (3 \times 75 = 225) \text{ and attach 1 trailing zero} \end{array}$$

Step 6: Add 675 to 2250 giving 2925. Place the decimal point two places to the left of the answer since the total number of decimal places in the problem is 2. The final answer is 29.25.

$$\begin{array}{r}
 7.5 \quad \text{one decimal place} \\
 \times 3.9 \quad \text{one decimal place} \\
 \hline
 675 \\
 \underline{2250} \\
 29.25 \quad \longrightarrow \quad \text{this is the final answer}
 \end{array}$$

B) You Try:

Multiply

a) 8.6×2.4

b) 5.6×9.3

Answers to B “You Try”:

a) 20.64

b) 52.08

C) Practice Problems.

Do the following multiplication problems without using the times table:

1) 9.0×8.9

2) 7.0×2.1

3) 3.7×2.2

4) 9.5×6.3

5) 7.9×2.0

6) 7.2×3.7

7) 9.0×7.7

8) 7.4×6.6

9) 7.5×2.1

10) 8.1×6.6

Answers to C “Practice Problems”: 1) 80.1; 2) 14.7; 3) 8.14; 4) 59.85; 5) 15.8; 6) 26.4; 7) 69.3; 8) 48.84; 9) 15.75; 10) 53.46

D) Quiz.

Multiply

1) 9.7×5.8

2) 5.1×5.8

3) 5.0×3.2

4) 5.0×5.7

5) 3.2×2.2

Answers to D "Quiz": 1) 56.26; 2) 29.58; 3) 16.00; 4) 28.50; 5) 7.04

E) More Practice Problems on Multiplication of Decimals.

Do the following multiplication problems without using the times table.

1) $\begin{array}{r} 9.7 \\ \times 5.6 \\ \hline \end{array}$

2) $\begin{array}{r} 3.4 \\ \times 2.1 \\ \hline \end{array}$

3) $\begin{array}{r} 9.9 \\ \times 8.5 \\ \hline \end{array}$

4) $\begin{array}{r} 3.0 \\ \times 2.7 \\ \hline \end{array}$

5) $\begin{array}{r} 5.1 \\ \times 2.2 \\ \hline \end{array}$

6) $\begin{array}{r} 8.4 \\ \times 7.1 \\ \hline \end{array}$

7) $\begin{array}{r} 9.3 \\ \times 2.0 \\ \hline \end{array}$

8) $\begin{array}{r} 8.5 \\ \times 6.6 \\ \hline \end{array}$

9) $\begin{array}{r} 9.7 \\ \times 7.4 \\ \hline \end{array}$

10) $\begin{array}{r} 5.2 \\ \times 2.7 \\ \hline \end{array}$

Answers to E "More Practice Problems": 1) 54.32; 2) 7.14; 3) 84.15; 4) 8.1; 5) 11.22; 6) 59.64; 7) 18.6; 8) 56.1; 9) 71.78; 10) 14.04

F) Quiz.

Multiply:

$$\begin{array}{r} 1) \quad 8.9 \\ \times 7.6 \\ \hline \end{array}$$

$$\begin{array}{r} 2) \quad 4.5 \\ \times 4.3 \\ \hline \end{array}$$

$$\begin{array}{r} 3) \quad 9.6 \\ \times 6.6 \\ \hline \end{array}$$

$$\begin{array}{r} 4) \quad 9.2 \\ \times 8.9 \\ \hline \end{array}$$

$$\begin{array}{r} 5) \quad 9.9 \\ \times 8.3 \\ \hline \end{array}$$

Answers to F "Quiz": 1) 67.64; 2) 19.35; 3) 63.36; 4) 81.88; 5) 82.17

IV. Dividing Decimals (Round answers to the nearest hundredth).

Introduction: This is the fourth of four parts on working with decimals. You're going to look at an example on how to divide decimals. Afterwards, you're going to try to do some problems on your own without using the times table. There will be 20 problems for you to practice. After you're successful in doing the practice problems, try the short quiz. The answers can be found at the end of each section.

A) Example: Divide $9.6 \div 2.8$

Step 1: Rewrite the problem as $2.8 \overline{)9.6}$ \longrightarrow this is the quotient where the answer is placed

Step 2: Change 2.8 to a whole number by moving the decimal point to the right one place. Move the decimal point in 9.6 to the right the same number of places as you did in 2.8.

$28 \overline{)96.000}$ \longrightarrow place a decimal point here
 \longrightarrow add zeros to divide to the hundredths place

Step 3: (Think: 28 times what number is close to 96?) $28 \times 3 = 84$ which is close to 96. Place the 3 above the 6. Then subtract 84 from 96 giving 12. Bring down the first 0 from 000.

$$\begin{array}{r} 3. \\ 28 \overline{)96.000} \\ \underline{-84} \quad \downarrow \\ 120 \end{array}$$

Step 4: (Think: 28 times what number is close to 96?) $28 \times 4 = 112$. Place the 4 above the first 0. Then subtract 112 from 120 giving 8. Bring down the second 0.

$$\begin{array}{r} 3.4 \\ 28 \overline{)96.000} \\ \underline{-84} \\ 120 \\ \underline{-112} \\ 80 \end{array}$$

Step 5: (Think: 28 times what number is close to 80?) $28 \times 2 = 56$. Place the 2 above the second 0. Then subtract 56 from 80 giving 24. Bring down the last 0.

$$\begin{array}{r} 3.42 \\ 28 \overline{)96.000} \\ \underline{-84} \\ 120 \\ \underline{-112} \\ 80 \\ \underline{-56} \\ 240 \end{array}$$

Step 6: (Think: 28 times what number is close to 240?) $28 \times 8 = 224$. Place the 3 above the last 0. Then subtract 224 from 240 giving 16.

$$3.428 \approx 3.43 \text{ (answer rounded to the nearest hundredth)}$$

$$\begin{array}{r} 3.428 \\ 28 \overline{)96.000} \\ \underline{-84} \\ 120 \\ \underline{-112} \\ 80 \\ \underline{-56} \\ 240 \\ \underline{-224} \\ 16 \end{array}$$

$9.6 \div 2.8 \approx 3.43$ → this is the final answer.

B) You Try:

a) $8.3 \div 4.6$

b) $6.9 \div 1.7$

Answers to B “You Try”:

a) 1.8

b) 4.06

C) Practice Problems.

Do the following division problems without using the times table. Round answer to the nearest hundredth if necessary.

1) $9.0 \div 8.7$

2) $8.9 \div 3.4$

3) $8.5 \div 3.2$

4) $7.3 \div 2.0$

5) $7.4 \div 6.8$

6) $5.0 \div 3.4$

7) $9.0 \div 8.5$

8) $6.0 \div 6.5$

9) $9.3 \div 3.3$

10) $5.7 \div 3.2$

Answers to C "Practice Problems": 1) 1.03; 2) 2.62; 3) 2.66; 4) 3.65; 5) 1.09; 6) 1.47; 7) 1.06; 8) 0.92; 9) 2.82; 10) 1.78

D) Quiz.

Divide:

1) $6.3 \div 4.6$

2) $7.7 \div 7.4$

3) $8.4 \div 2.3$

4) $7.9 \div 5.5$

5) $9.1 \div 9.8$

Answers to D "Quiz": 1) 1.37; 2) 1.04; 3) 3.65; 4) 1.44; 5) 0.93

E. More Practice Problems on Division of Decimals.

Do the following division problems without using the times table. Round answer to the nearest hundredth if necessary.

1) $2.6 \overline{)5.3}$

2) $2.0 \overline{)6.4}$

3) $4.2 \overline{)6.0}$

4) $5.3 \overline{)8.0}$

5) $2.9 \overline{)8.0}$

6) $6.1 \overline{)7.6}$

7) $5.2 \overline{)8.2}$

8) $4.4 \overline{)8.3}$

9) $3.1 \overline{)8.1}$

10) $5.5 \overline{)8.4}$

Answers to E “More Practice Problems”: 1) 2.04; 2) 3.2; 3) 1.43; 4) 1.51; 5) 2.76; 6) 1.25; 7) 1.58; 8) 1.89; 9) 2.61; 10) 1.53

F. Quiz.

Divide:

1) $7.8 \overline{)9.9}$

2) $7.8 \overline{)7.9}$

3) $2.3 \overline{)2.0}$

4) $3.6 \overline{)9.6}$

5) $4.9 \overline{)6.8}$

Answers to F “Quiz”: 1) 1.27; 2) 1.01; 3) 0.87; 4) 2.67; 5) 1.39