

EE8-10 Decimal Review

In a decimal fraction, the denominator is a power of 10. Examples: $\frac{7}{10}$, $\frac{23}{100}$, and $\frac{247}{1000}$ are decimal fractions. 10, 100, 1,000, and so on, are powers of 10.

1. Find the missing equivalent decimal fractions.

a) $\frac{7}{10} = \frac{70}{100}$

b) $\frac{35}{100} = \frac{350}{1000}$

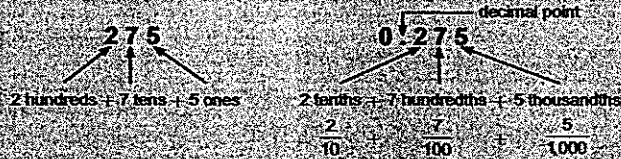
c) $\frac{9}{10} = \frac{900}{1000}$

d) $\frac{3}{10} = \frac{30}{100} = \frac{300}{1000}$

e) $\frac{9}{10} = \frac{90}{100} = \frac{900}{1000}$

f) $\frac{5}{10} = \frac{50}{100} = \frac{500}{1000}$

Decimals are a way to record place values based on decimal fractions.



2. Write the number in expanded form.

a) $2.35 = 2 + \frac{3}{10} + \frac{5}{100}$

b) $3.49 = 3 + \frac{4}{10} + \frac{9}{100}$

c) $4.178 = 4 + \frac{1}{10} + \frac{7}{100} + \frac{8}{1000}$

d) $7.490 = 7 + \frac{4}{10} + \frac{9}{100} + \frac{0}{1000}$

e) $9.073 = 9 + \frac{0}{10} + \frac{7}{100} + \frac{3}{1000}$

f) $6.102 = 6 + \frac{1}{10} + \frac{0}{100} + \frac{2}{1000}$

3. Write the expanded form as a decimal.

a) $2 + \frac{3}{10} + \frac{9}{100} + \frac{1}{1000} = 2.391$

b) $7 + \frac{2}{10} + \frac{3}{100} + \frac{4}{1000} = 7.234$

c) $9 + \frac{3}{10} + \frac{0}{100} + \frac{5}{1000} = 9.305$

d) $4 + \frac{0}{10} + \frac{6}{100} + \frac{8}{1000} = 4.068$

Bonus ▶

e) $4 + \frac{1}{10} + \frac{6}{1000} = 4.106$

f) $2 + \frac{3}{100} + \frac{6}{1000} = 2.036$

You can write 0.27 as a single fraction: $0.27 = \frac{2}{10} + \frac{7}{100} = \frac{20}{100} + \frac{7}{100} = \frac{27}{100}$

You can write 0.135 as a single fraction: $0.135 = \frac{1}{10} + \frac{3}{100} + \frac{5}{1000} = \frac{100}{1000} + \frac{30}{1000} + \frac{5}{1000} = \frac{135}{1000}$

4. Write the decimal as a single fraction.

a) $0.37 = \frac{37}{100}$

b) $0.28 = \frac{28}{100}$

c) $0.43 = \frac{43}{100}$

d) $0.07 = \frac{7}{100}$

e) $0.219 = \frac{219}{1000}$

f) $0.614 = \frac{614}{1000}$

g) $0.438 = \frac{438}{1000}$

h) $0.029 = \frac{29}{1000}$

Multiplying by 10 moves the decimal point 1 place to the right. $0.37 \times 10 = \frac{37}{100} \times 10 = \frac{370}{100} = 3 + \frac{70}{100} = 3.70$

0 0 3 7 0 0

5. Multiply by 10 by moving the decimal point.

a) 3.5×10

b) 0.47×10

c) 38.0×10

0 0 3 5 0 0

0 0 4 7 0 0

0 3 8 0 0 0

= 35.0

= 4.7

= 380.

Multiplying by 100 moves the decimal point 2 places to the right. $0.028 \times 100 = \frac{28}{1000} \times 100 = \frac{2800}{1000} = 2 + \frac{800}{1000} = 2.800$

6. Multiply by 100 by moving the decimal point.

a) 2.9×100

b) 0.36×100

c) 52.4×100

0 0 2 9 0 0

0 0 3 6 0 0

0 5 2 4 0 0

= 290.0

= 36

= 5240

7. Multiply.

a) $9.28 \times 10 = 92.8$

b) $0.063 \times 100 = 6.3$

c) $2.367 \times 10 = 23.67$

d) $0.0045 \times 100 = 0.45$

e) $0.4 \times 10 = 4$

f) $6.1 \times 100 = 610$

g) $0.65 \times 10 = 6.5$

h) $0.0043 \times 100 = 0.43$

i) $8.34 \times 100 = 834$

very

EE8-11 Operations With Decimals

Decimals can be written as decimal fractions. The number of decimal digits is the same as the number of zeros in the denominator.

Examples: $0.3 = \frac{3}{10}$ $0.37 = \frac{37}{100}$ $0.371 = \frac{371}{1000}$

1. Write as a decimal fraction.

a) $0.35 = \frac{35}{100}$ b) $0.7 = \frac{7}{10}$ c) $0.275 = \frac{275}{1000}$ d) $0.0249 = \frac{249}{10000}$

We can add or subtract decimals as decimal fractions. $0.27 + 0.34 = \frac{27}{100} + \frac{34}{100} = \frac{61}{100} = 0.61$

2. Add or subtract as decimal fractions.

a) $0.5 + 0.3 = 0.8$ b) $0.48 - 0.23 = 0.25$ c) $0.416 - 0.135 = 0.281$ d) $0.01 + 0.02 = 0.03$
 $\frac{5}{10} + \frac{3}{10} = \frac{8}{10}$ $\frac{48}{100} - \frac{23}{100} = \frac{25}{100}$ $\frac{416}{1000} - \frac{135}{1000} = \frac{281}{1000}$ $\frac{1}{100} + \frac{2}{100} = \frac{3}{100}$

To add or subtract decimals without using fractions:

Step 1: Line up the decimal points. Write zeros to the right of the last digit so all numbers will have the same number of decimal digits.

Step 2: Add or subtract the decimals as if they were whole numbers. Place the decimal point in the answer under the other decimal points.

Example: $1.45 - 0.924$

		4	
1	4	5	0
0	9	2	4
0	5	2	6

extra zero

3. Add or subtract.

a) $0.145 + 1.237 = 1.382$ b) $2.35 - 1.18 = 1.17$ c) $13.45 - 9.237 = 4.213$ d) $5.06 + 13.573 = 18.633$

4. Jane spent \$8.45 on lunch and paid with a \$20 bill. How much is her change?

$\$20 - \$8.45 = \$11.55$

To multiply numbers with decimals, multiply as if they were whole numbers and then place the decimal point so that there will be the same number of decimal digits.

Example: $1.34 \times 2 = \frac{134}{100} \times 2 = \frac{268}{100} = 2.68$

5. Multiply.

a) 2.34×3

	2	3	4
x			3
	7	0	2

b) 4.125×2

	4	1	2	5
x				2
	8	2	5	0

c) 12.37×3

	1	2	3	7
x				3
	3	7	1	1

d) 8.45×9

	8	4	5	
x			9	
	7	6	0	5

To multiply a decimal by a decimal:

Example: $1.3 \times 0.12 = \frac{13}{10} \times \frac{12}{100} = \frac{156}{1000} = 0.156$

Step 1: Multiply the decimals as if they were whole numbers.

$13 \times 12 = 156$

Step 2: Count the digits after the decimal points, then find the total number of decimal digits.

1.3 has 1 digit after the decimal point. 0.12 has 2 digits after the decimal point. $1 + 2 = 3$

Step 3: Shift the decimal point left that many places.

0.156 . So $1.3 \times 0.12 = 0.156$

6. Multiply.

a) 2.34×1.2

	2	3	4	
x		1	2	
	4	6	8	
+	2	3	4	0
	2	8	0	8

b) 32.1×2.4

	3	2	1	
x		2	4	
	1	2	8	4
+	6	4	2	0
	7	7	0	4

c) 1.345×2.9

	1	3	4	5	
x			2	9	
	1	2	1	0	5
+	2	6	9	0	0
	3	9	0	0	5

d) $9.84 \times 0.1 = 0.984$

e) $9.84 \times 0.01 = 0.0984$

f) $42.35 \times 21.02 = 890.197$

7. To convert temperatures in degrees Celsius to degrees Fahrenheit, multiply the Celsius temperature by 1.8 and add 32. Convert 23.5 degrees Celsius into degrees Fahrenheit.

$23.5 \times 1.8 + 32 = 74.3^\circ\text{F}$

8. The state tax in New York State is found by multiplying the retail price by 0.075. Find the tax on a sofa with a price tag of \$240.

$240 \times 0.075 = \$18$

REMINDER: To multiply a decimal by 10, move the decimal point 1 place to the right. To multiply a decimal by 100, move the decimal point 2 places to the right.

Examples: $2.35 \times 10 = 23.5$ $3.146 \times 100 = 314.6$ $23 \times 10 = 23.0 \times 10 = 230.0$

9. Multiply mentally.

a) $54.67 \times 10 = 546.7$

b) $0.345 \times 100 = 34.5$

c) $2.78 \times 1,000 = 2,780$

d) $0.002 \times 100 = 0.2$

e) $0.034 \times 1,000 = 34$

f) $29.38 \times 10 = 293.8$

g) $0.0098 \times 100 = 0.98$

h) $4.82 \times 1,000 = 4,820$