

Section 5.4 Division with Decimals

1. Dividing by a Whole Number: To divide a decimal number by a whole number

- Divide as you would if the decimal point was not there. If the decimal number has digits after the decimal place, you may write as many zeroes as you need on the right side of the decimal number.
- Divide until there is no remainder or until the answer begins a repeating sequence unless the instructions say to round to a certain decimal place.
- The decimal point in the answer is placed directly above the decimal point in the dividend.

Example 1: Simplify each of the following.

a. $190.8 \div 45$

b. $16 \div 6$

Example 2: Simplify each of the following. Round your answer to the nearest hundredth.

a. $0.543 \div 21$

b. $16 \div 6$

2. Dividing by a Decimal: If the divisor is a decimal, change it to a whole number by moving the decimal point to the right as many places as necessary. Then, also move the decimal point in the dividend the same number of places in the same direction. Next, complete the division process using the rule for dividing by a whole number.

Why does this process work? It works because moving the decimal point to the right is the same as multiplying by a power of ten, i.e. moving the decimal one place to the right is the same as multiplying by ten, moving two places is the same as multiplying by 100, and so on. If you move the decimal point the same number of places to the right in both the dividend and the divisor, that's like multiplying the numerator and the denominator of a fraction by the same power of ten.

Example 3: Use your calculator to compute each of the following and compare your answers.

a. $0.3778 \div .25$

b. $3.778 \div 2.5$

c. $37.78 \div 25$

d. $377.8 \div 250$

Example 4: Divide. Remember to make the divisor a whole number before you perform the division.

$$0.3778 \div .25$$

Example 5: Divide. Round your answer to the nearest hundredth, if necessary.

$$0.49 \div 0.048$$

3. Calculating Grade Point Averages: Set up a chart showing, for each class, the number of units, the final grade, and the grade points. Calculate grade points by multiplying the number of units and the point value for the grade earned. The point values are:

- A 4 points**
- B 3 points**
- C 2 points**
- D 1 point**
- F 0 points**

Add the grade points earned for each course to get a total grade point. Divide this total by the sum of the units to get the grade point average.

Example 6: Calculate the grade point average. Use your calculator. Round your answer to the nearest hundredth.

Algebra	5 units	B
Chemistry	4 units	C
English	3 units	A
History	3 units	B

4. Applied Problems: Decide whether to add, subtract or multiply to solve the given problem, and then apply the appropriate rule for adding, subtracting, or multiplying decimal numbers. When solving applied problems, use algebraic format: identify the quantity that your variable represents, write an equation, solve it, and write your answer in English words. Remember that the steps count for points!!

Example 7: If gas costs \$2.29 per gallon, how much does 18.9 gallons cost? Round to the nearest cent, if necessary.

Practice Problems:

a. Divide: $146.38 \div 26$

b. Divide: $\frac{2.40}{0.74}$

c. Solve the applied problem using algebraic format: How many hours does a person making \$6.78 per hour have to work in order to earn \$257.64?

d. Divide and round to the nearest hundredth: $\frac{7.26}{2.3}$

Answers to Practice Problems:

- a. 5.63; b. $\overline{3.243}$ (Don't round. Show the repeating portion with a bar.)
c. 38 hours; d. 3.16 (after rounding)

Note: Portions of this document are excerpted from the textbook *Prealgebra*, 7th ed. by Charles McKeague