



# Algebra 2 Workbook

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Ratio and proportion

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MATH

## RATIOS AND PROPORTION

- 1. The class has 12 girls and 18 boys. What is the ratio of boys to the total number of students in the class?
  
- 2. The class has 15 girls and 10 boys. What is the ratio of boys to girls in the class?
  
- 3. The ratio of boys to girls in the class is 4 : 3. The total number of students in the class is 28. How many girls are in the class?
  
- 4. The ratio of boys to girls in the class is 5 : 3. The total number of students in the class is 32. How many boys are in the class?
  
- 5. Two numbers have a ratio of 1 to 4 and a sum of 40. What are the two numbers?
  
- 6. Two numbers have a ratio of 4 to 7 and a sum of 99. What are the two numbers?



- 7. There are 11 quarters, 9 dimes, and 13 nickels. What is the ratio of dimes to the total number of coins?
- 8. The ratio of dimes to quarters is  $3 : 2$ . The total value of the coins is \$2.40. How many quarters are there?



## CHEMICAL COMPOUNDS

- 1. Find the molar mass for one molecule of table salt in grams per mole. Table salt has the molecular formula  $\text{NaCl}$ .

Sodium (Na) has a mass of 22.989770 g/mol

Chlorine (Cl) has a mass of 35.453 g/mol

- 2. Find the molar mass for one molecule of isopropyl chloride in grams per mole. Isopropyl chloride has the molecular formula  $\text{C}_3\text{H}_7\text{Cl}$ .

Carbon (C) has a mass of 12.0107 g/mol

Hydrogen (H) has a mass of 1.00794 g/mol

Chlorine (Cl) has a mass of 35.453 g/mol

- 3. Find the molar mass for one molecule of glucose in grams per mole. Glucose has the molecular formula  $\text{C}_6\text{H}_{12}\text{O}_6$ .

Carbon (C) has a mass of 12.0107 g/mol

Hydrogen (H) has a mass of 1.00794 g/mol

Oxygen (O) has a mass of 15.9994 g/mol



- 4. Find the molar mass for one molecule of silver phosphate in grams per mole. Silver phosphate has the molecular formula  $\text{Ag}_3\text{PO}_4$ .

Silver (Ag) has a mass of 107.8682 g/mol

Phosphorus (P) has a mass of 30.973761 g/mol

Oxygen (O) has a mass of 15.9994 g/mol

- 5. Find the molar mass for one molecule of vitamin C (ascorbic acid) in grams per mole. Vitamin C has the molecular formula  $\text{C}_6\text{H}_8\text{O}_6$ .

Carbon (C) has a mass of 12.0107 g/mol

Hydrogen (H) has a mass of 1.00794 g/mol

Oxygen (O) has a mass of 15.9994 g/mol

- 6. Find the molar mass of calcium (Ca) in one mole of calcium carbonate.  $\text{CaCO}_3$  has a molar mass of 100.0869 g/mol.

Carbon (C) has a mass of 12.0107 g/mol

Oxygen (O) has a mass of 15.9994 g/mol

- 7. Find the molar mass of one atom of chlorine (Cl) in one mole of magnesium chloride.  $\text{MgCl}_2$  has a molar mass of 95.211 g/mol.



Magnesium (Mg) has a mass of 24.3050 g/mol

■ 8. Find the molar mass of bromine (Br) in one mole of potassium bromide (KBr), if KBr has a molar mass of 119.0023 g/mol, and potassium (K) has a mass of 39.0983 g/mol.

■ 9. Find the total molar mass of iron (Fe) in one mole of ferric oxide.  $\text{Fe}_2\text{O}_3$  has a molar mass of 159.6882 g/mol.

Oxygen (O) has a mass of 15.9994 g/mol

■ 10. Find the molar mass of one atom of nitrogen (N) in one mole of caffeine ( $\text{C}_8\text{H}_{10}\text{N}_4\text{O}_2$ ).  $\text{C}_8\text{H}_{10}\text{N}_4\text{O}_2$  has a molar mass of 194.1906 g/mol.

Carbon (C) has a mass of 12.0107 g/mol

Hydrogen (H) has a mass of 1.00794 g/mol

Oxygen (O) has a mass of 15.9994 g/mol



## CONVERTING BETWEEN FRACTIONS, DECIMALS, AND PERCENTS

- 1. Convert  $60\%$  to a fraction in lowest terms.
- 2. Convert 1.42 to a percent.
- 3. Convert  $33.5\%$  to a decimal.
- 4. Convert  $\frac{2}{3}$  to a percent.
- 5. Find  $15\%$  of 48.
- 6. Find a mixed fraction that represents  $8\%$  of 120.
- 7. Convert  $\frac{100}{160}$  to a percent.
- 8. Convert the fraction  $\frac{20}{60}$  to a percent.



## PERCENT MARKUP

- 1. A computer store purchases a laptop for \$500. The markup amount is \$150. What is the selling price?
  
- 2. A book store purchases a book for \$6.00 and sells it for \$9.00. What percentage of the original price is the markup amount?
  
- 3. A cellphone store purchases a used smartphone for \$45 and sells it for \$121.50. What percentage of the original price is the markup amount?
  
- 4. A bike shop buys a used bike for \$130 and marks up the price by 35 %. What is the markup amount?
  
- 5. A furniture store buys a table for \$84 and marks up the price by 18 %. What is the markup amount?
  
- 6. It costs a car manufacturer \$12,800 to produce a car. The percent markup is 48 %. What is the selling price of the car.





- 7. A bakery purchases a dozen sugar cookies for \$2.25. The markup percent is 60 %. What is the selling price of the dozen sugar cookies?
- 8. A store purchases dresses from a manufacturer, marks them up by 75 %, and sells each dress for \$91. How much did the store pay the manufacturer for each dress?
- 9. If a furniture store purchases a chair from a manufacturer, marks it up by 24 %, and sells the chair for \$84.94. How much did the furniture store pay the manufacturer for the chair?
- 10. A store purchases a painting from an artist, marks it up by 12 %, and sells the painting for \$119.84. How much did the store pay the artist for the painting?



## PERCENT MARKDOWN

- 1. A computer has an original price of \$375 and is now on sale for \$255.  
What is the percent markdown?
  
- 2. A sweater has an original price of \$34 and is now on sale for \$25.50.  
What is the percent markdown?
  
- 3. A toy train set has an original price of \$52 and is now on sale for \$44.20.  
What is the percent markdown?
  
- 4. A sofa has an original price of \$649 and is now on sale for \$584.10.  
What is the percent markdown?
  
- 5. A bike has an original price of \$100 and is now on sale for \$65. What is the percent markdown?
  
- 6. The regular price of an item is \$75, but the item is now on clearance for 40 % off the regular price. What is the sale price of the item?



- 7. The regular price of the latest smartphone is \$749. After two years, the smartphone is on sale for 25 % off. What is the sale price of the item?
- 8. The regular price of a dress is \$125. The dress is on clearance for 80 % off. What is the sale price of the item?
- 9. The regular price of a doll is \$42. The doll goes on sale for 15 % off. What is the sale price of the item?
- 10. The regular price of a rocking chair is \$134. The chair goes on sale for 60 % off. What is the sale price of the item?



## CALCULATING COMMISSION

- 1. A makeup company advertises that you can make 15 % commission on sales of their product. If you sell \$3,252 worth of product, how much money did you earn?
  
- 2. An employee at a clothing store earned \$1,450 in hourly pay for the month. She also sold \$4,250 worth of merchandise and will earn a commission of 6 % on those sales. What is the employee's expected paycheck before tax deductions?
  
- 3. An employee at a furniture store earned \$1,800 in hourly pay for the month. She also sold \$12,000 worth of merchandise and will earn a commission of 8 % on those sales. What is the employee's expected paycheck before tax deductions?
  
- 4. A car salesman makes a 9 % commission on the selling price of any car he sells. If he sells a car for \$17,599, how much does he earn in commission?
  
- 5. A car salesman earns \$48,000 per year plus a commission of 12 % on all the cars he sells. If he wants a yearly salary of \$72,500, how much money in car sales does he need to make?



- 6. Brittany earns \$1,772.10 in commission of makeup products. If she earns 18 % commission, how much money in makeup sales did she make?
- 7. Anthony works at a clothing store and earned \$1,644.75 last month before tax deductions. If he earns 7.5 % in commission and his hourly pay was \$975 for the month, how much clothing did he sell?
- 8. An employee at a furniture store earned \$2,299.90 last month before tax deductions. If she earns 11 % in commission and her hourly pay was \$1,245 for the month, how much money in furniture sales did she make?



## CALCULATING SIMPLE INTEREST

- 1. If you deposit \$300 into a savings account and it earns 2 % in simple interest, how much interest will you earn on the account in 7 years?
  
- 2. If you deposit \$150 into a savings account and it earns 9 % in simple interest, how much interest will you earn on the account in 5 years?
  
- 3. If you invest \$500 that earns 13 % in simple interest, how much interest will you earn in 12 years?
  
- 4. If you invest \$7,000 that earns 21 % in simple interest, how much interest will you earn in 35 years?
  
- 5. If you deposit \$275 into a savings account that earns 4 % simple interest, how much is in the account after 2 years?
  
- 6. If you deposit \$50 into a savings account that earns 8 % simple interest, how much is in the account after 22 years?



- 7. If you invest \$430 that earns 17 % simple interest, how much is in the account after 6 years?
- 8. If you invest \$1,230 that earns 14 % simple interest, how much is in the account after 10 years?



