



Word Problem on Percentage: Problem Type 1

• Example 1

A student needs 70% to pass an examination containing 50 questions. What is the smallest number of questions that she must get right?

Solution This problem can be rephrased as: What is 70% of 50?

We have:

$$70\% \times 50 = \frac{70}{100} \times 50 = 35.$$

She must answer at least 35 questions correctly to pass.

● ● ● CHECK YOURSELF 1

Generally, 72% of the students in a chemistry class pass the course. If there are 150 students in the class, how many can you expect to pass?

• Example 2

Find the interest you must pay if you borrow \$2000 for 1 year with an interest rate of $9\frac{1}{2}\%$.

Solution This problem amounts to finding 9.5% of 2000.

We get:

$$9.5\% \times 2000 = \frac{9.5}{100} \times 2000 = 9.5 \times 20 = 190.$$

The interest to be paid is \$190.

● ● ● CHECK YOURSELF 2

You invest \$5000 for 1 year at $8\frac{1}{2}\%$. How much interest will you earn?

● ● ● CHECK YOURSELF ANSWERS

1. 108. 2. \$425.
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4.7 Exercises

Name _____

Section _____

Date _____

A N S W E R S

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Solve each of the following applications.

1. **Interest.** What interest will you pay on a \$3400 loan for 1 year if the interest rate is 12%?
2. **Chemistry.** A chemist has 300 milliliters of solution that is 18% acid. How many milliliters of acid are in the solution?
3. **Payroll deductions.** Roberto has 26% of his pay withheld for deductions. If he earns \$550 per week, what amount is withheld?
4. **Commission.** A real estate agent's commission rate is 6%. What will be the amount of the commission on the sale of an \$85,000 home?
5. **Sales tax.** A state sales tax is levied at a rate of 6.4%. How much tax would one pay on a purchase of \$260?
6. **Down payment.** Betty must make a $9\frac{1}{2}\%$ down payment on the purchase of a \$2000 motorcycle. How much must she pay down?
7. **Commission.** If a house sells for \$125,000 and the commission rate is $6\frac{1}{2}\%$, how much will the salesperson make for the sale?
8. **Test scores.** Marla needs 70% on a final test to receive a C for a course. If the exam has 120 questions, how many questions must she answer correctly?
9. **Stock.** Mr. Jackson buys stock for \$15,000. At the end of 6 months, its value has decreased 7.5%. What is the stock worth at the end of the period?
10. **Population.** The population of a town increases 14% in 2 years. If the population was 6000 originally, what is the population after the increase?
11. **Markup.** A store marks up merchandise 25% to allow for profit. If an item costs the store \$11, what will its selling price be?

12. **Payroll deductions.** Tranh's pay is \$450 per week. If deductions from his paycheck average 25%, what is the amount of his weekly paycheck (after deductions)?
13. **Gasoline.** Gasoline accounts for 85% of the motor fuel consumed in the United States every day. If 8882 thousand barrels of motor fuel is consumed each day, how much gasoline, to the nearest thousand barrels, is consumed each day in the United States?
14. **Pollution.** Each year, 540 million metric tons of carbon dioxide is added to the atmosphere by the United States. Burning gasoline and other transportation fuels is responsible for 35% of the carbon dioxide emissions in the United States. How much carbon dioxide is emitted each year by the burning of transportation fuels in the United States?
15. **Mixtures.** A can of mixed nuts contains 60% peanuts. If the can holds 32 ounces, how many ounces of peanuts does it contain?
16. **Sales tax.** A sales tax rate is $5\frac{1}{2}\%$. If Susan buys a television set for \$450, how much sales tax must she pay?
17. **Savings.** You are told that if you install storm windows, you will save 14% on your heating costs. If your annual cost for heating was \$950 before the windows were installed, what will the annual savings be?
18. **Test scores.** On his 50-question biology examination, Bruce answered 78% correctly. How many questions did he answer correctly?
19. **Salary.** Carrie earned \$12,000 one year and then received a 7.5% raise. What is her new yearly salary?
20. **Enrollment.** A school's enrollment increases 6.5% in a given year. If the enrollment was 1800 students originally, how many students are there after the increase?
21. **Salary.** Miguel's salary is \$1800 per month. If deductions average 26%, what is his take-home pay?
22. **Mileage.** A car was rated at 32 miles per gallon. A new model is advertised as having a 7.5% increase in mileage. What mileage should the new model have?

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