# Percent

1) A store puts everything on sale for 20% off.  If the sales tax is 8%, what percent of the original marked price is the final cost including tax? Round to the nearest tenth (3) *2004-WO2-3*

2) At Martha's Boutique, a style of shirt was not selling.  Martha decided to mark the price of each shirt down by 35%.  The discounted price for each shirt is now $26.  What was the original price of a shirt? (2) *2004-WU5-2*

3) Celsius temperatures can be converted to Fahrenheit by doubling the Celsius temperature, reducing the result by 10%, and then adding 32.  What Fahrenheit temperature corresponds to 20° Celsius? (2) *2004-WU6-8*

4) "Buy 3, Get 2 Free" is equivalent to purchasing the five items at a discount of what percent? (2) *2004-WO4-6*

5) Mark shoots a basketball until he makes 20 shots or until he has made 60% of his shots, whichever happens first.  After he has made 10 of his first 20 shots, how many more shots in a row does he have to make to be finished? (1) *2004-WO5-1*

6) A car radiator has a 16-quart capacity and is currently filled with a 40% antifreeze solution.  How many quarts of this solution should be drained off and replaced with 100% antifreeze to obtain a 50% antifreeze solution? *2004-WO12-10*

7) An ad read, "take an additional 10% off any item which is already discounted 30%". These two discounts are the same as one of n%.  What is the value of n? (1) *1999-WU9-7*

8) In May, the price of a pair of jeans was 250% of its wholesale cost (price the store buys the jeans).  In June, the price was reduced by 25%.  After an additional 50% discount in July, the Jeans cost $22.50.  What was the wholesale cost of the Jeans?  (2) *1999-WU10-7*

9) Corey is reading a 300-page book.  After one hour, he had finished 8% of the book.  Assuming that he reads at a constant rate, how many more hours will it take him to read the rest of the book? (2) *1999-WU11-8*

10) A baseball team won 50% of the first 120 games it played in a 162-game season. What is the minimum number of its remaining games that the team must win in order to win at least 60% of its games this season?  (2) *1999-WO2-1*

11) The wholesale price of a CD player is $180.  The storeowner sets the price so that she can yield a 35% profit over the wholesale cost when the CD player sells at a 20% discount.  What is the price of the CD player? (2) *1999-WO2-2*

12) The purchase price of a bicycle, which includes 7% sales tax, is $374.50.  What is the price before tax is added? (2) *1999-WO3-7*

13) The lengths of the sides of a rectangular prism measuring 4 by 6 by 8 centimeters are each increased in length by 50% (3) *1999-WO3-10*

14) Jennifer puts $12\frac{1}{2}$ % of the monthly rent from a rental property into an account for repairs and maintenance.  She wants the annual rent to be at least $9250 more than repairs and maintenance.  What is the minimum amount of money she needs to charge for monthly rent to accomplish these goals? (2) *1999-WO4-5*

15) Tina deposited $200 at 8% interest compounded annually for 3 years.  What is the amount of interest earned? (2) *1999-WO4-8*

16) School portraits come in two sizes, 5″ by 7″ and 3″ by 5″.  The area of the smaller portrait is what percent of the area of the larger portrait? (1) *1999-WO5-9*

17) A car that originally sold for $12,000 depreciates at a rate of 20% per year. What is the value of the car at the end of 3 years? (1) *1999-WO8-1*

18) A rectangle is divided into five congruent regions.  Sung Min removes one-fourth of the first region, one-fifth of the second region, one-sixth of the third region and one-eighth of the fourth region.  What percent of the original region remains? (2) *1999-WO9-1*

19) The original price of an item was $50.  The store deducted 20% and then deducted an additional 20% off the reduced price.  How much money would a customer save if the store had simply reduced the original price by 40%? (1) *2000-WU2-5*

20) A house was sold for $649,000.  If the selling price represents a 25% profit over the purchase price, what was the purchase price of the house? (2) *2000-WU12-10*

21) In a savings account, $5,000 is invested at an annual rate of 9% simple interest. How much money would have to be invested at 7.5% simple interest to earn an equal amount of interest? (1) *2000-WU13-6*

22) Of the 1.5 million people of voting age in Smithville, 76% are registered voters. Of those registered, 42% voted in the most recent election.  The wining candidate received 53% of those votes.  How many votes did the winner receive? (1) *2000-WO2-3*

23) How much interest is earned in two years on a deposit of $10,000 invested at 4.5% compounded annually?  Round to the nearest cent. (2) *2000-WO3-9*

24) During a clearance sale, a store reduces each item's price each day by 20% from the previous day's price.  The price of a jacket on Monday was $125.  What is the price of the unsold jacket on Friday?  Round to the nearest cent. (1) *2003-WO2-10*

25) Kyle's science project grade has two parts.  The oral presentation is worth 30 points, and the written report is worth 70 points.  Kyle earns 84% of the possible points for his written report.  To earn at least 87% of the possible points for the entire project, what percent of the possible points for the oral presentation must he earn? (2) *2003-WU6-6*

26) Tracy wants to leave the waiter a tip to equal 10% of the cost of her family's meal and tax.  When the check comes, an 8% tip has already been included and the total is $50.76.  How much more money does Tracy need to add so that the waiter receives the 10% tip Tracy intended? (3) *2003-WO4-8*

27) A full gas tanker holds 9000 gallons of gasoline.  A car that gets 25 miles per gallon is driven 20 miles per day.  What percent of the gas in the full tanker will the car use in 365 days? Round to the nearest tenth. (2) *2003-WO4-9*

28) The length of a rectangle is increased by 25%.  To keep the area of the rectangle the same, by what percent must the width be decreased? (2) *2003-WU10-3*

29) 500 raffle tickets were sold at a fundraiser for $5 each.  8 winning tickets paid as follows: one ticket at $750, two tickets at $250 each, and five tickets at $125 each.  The revenue from ticket sales that was not used to pay off the prizes was profit.  What percent of the revenue from ticket sales was profit? (1) *2003-WO7-10*

30) Jared has an average of 86% in his math class before the final exam.  The final exam is 20% of his total grade.  There are 55 points possible in the final exam and partial points are not given.  If Jared wants to get an average of at least 88% in the class, what is the least number of points he needs to earn on the final exam? (2) *2003-WU16-4*

31) Mike has thrown 24 football passes and completed 37.5% of them.  What is the least number of additional passes he will have to complete if he wants an overall completion rate greater than 62%? (3) *2002-WO4-5*

32) Each edge of a cube is decreased by 40%.  What is the percent of decrease in the volume of the cube? (3) *2002-WU14-5*

33) A raffle was held and 1200 tickets were sold for $2.50 each.  There were 17 winners.  The first-prize winner received $1,000.  The four second-prize winners each received $250.  The remaining winners each received $50.  What percent of the total ticket sales was profit? Round to nearest whole number. (2) *2001-WU7-5*

34) If x is 150% of y, what percent of 3x is 4y?  Round to the nearest whole number. (3) *2002-WO1-1*

35) The cost of a new car, including n% sales tax, was $20,276.50.  The cost before sales tax was $18,950.  What was the value of n? (2) *2002-WO2-1*

36) Peter had $300 in his savings account before he made a deposit.  Paul had $450 in his account before he made a withdrawal.  After these two transactions, Mary noticed that they each had the same account balance.  She also noticed that the amount in Peter's account increased by the same percent that the amount in Paul's account decreased.  What was the percent? (2) *1997-WU5-4*

37) The lengths of the sides of an 8 x 8 square are increased by 2 cm each.  The area of the square has been increased by what percent? Round to eh nearest whole percent. (2) *1997-WU8-1*

38) A poll was taken and it was found that 12 students went to the movies on Friday, 10 students went to the movies on Thursday, 4 went on both days, and 7 did not go on either day.  What percent of students went to the movies only on Thursday? (1) *1997-WU14-1*

39) Sylvia earns a commission of $1\frac{1}{2}$% on the selling price for each car that she sells.  Last year, she sold 106 cars and earned $19,716 in commissions.  Determine the average selling price of the cars that she sold. (2) *1997-WU20-9*

40) The yearly changes in the population of a town for 4 consecutive years were, respectively, 25% increase, 25% increase, 25% decrease and 25% decrease.  What is the net percent decrease over the 4 years, to the nearest whole percent? (2) *1997-WO3-8*

41) A rectangle has dimensions 20 inches by 30 inches.  If one side is increased by 30% and the other side is decreased by 20%, then what is the largest possible area of the new rectangle? (2) *2001-WU12-7*

42) Paula's score on a quiz was 78, which was 130% of Samantha's score.  What was Samantha's score? (1) *2001-WU16-1*

43) If x is 150% of y, what percent of 3x is 4y?  Round to the nearest whole number. (3) *2001-WO1-1*

44) What is $\frac{1}{5}$% of 140? (2) *2001-WO1-6*

45) The cost of a new car, including n% sales tax, was $20,276.50.  The cost before sales tax was $18,950.  What was the value of n? (2) *2001-WO2-1*

46) 61% of the world's population lives in Asia.  Of the remainder, 14% live in South America and 49% of South Americans live in Brazil.  What percent of the world's population live in Brazil?  Round to nearest tenth. (1) *2001-WO3-2*

47) The gasoline-oil mixture recommended for a motorized weed trimmer is 39:1.  What percent of each gallon of fuel mixture is oil? (1) *1996-WU6-5*

48) A rectangle is formed by increasing one side of a square by 25%. By what percent must the adjacent side be decreased to form a new rectangle with the same area as the original square? (1) *1996-WU11-8*

49) A school has 7 periods a day. Six are 48 minutes in length and one is 1 hour. The school day starts at 7:35 am and ends at 2:13 pm with 4 minutes passing time between periods and one-half hour for lunch. What percent of the day is spent in class? (2) *1993-WU1-7*

50) Two of the opposite sides of a square are increased by 20% and the other two sides are decreased by 25%. What is the percent decrease in the area? (2) *1993-WU5-2*

51) 10 ounces of fruit drink is 90% juice. How many ounces of water must be added to dilute the mixture to 50% juice? (2) *1993-WU13-3*

52) An auto dealer purchases a car at his dealer cost, adds a 30% mark-up to arrive at the list price, later has to discount that price by 20%, and ends up selling the car for $12,480. What was his net profit? (2) *1993-WO2-5*

53) A 3 x 5 photograph is enlarged to 5 x 7 size. What is the percent increase in the area? (1) *1995-WU4-3*

54) Blue and green are mixed to make Tyrolean Blue paint, and the amount of green paint is 25% of the amount of blue paint. How many gallons of blue paint are needed to make 10 gallons of the Tyrolean Blue mixture? (2) *1995-WU15-6*

55) Mick Kanik has a container holding 110 quarts of a mixture of 30% grade A oil and 70% grade E oil. He has a second container holding 30 quarts of a mixture of 30% grade E oil and 70% grade A oil. If he mixes them, what percent of the mixture will be grade A oil? Round to the nearest whole percent. (3) *1995-WO4-3*

| | 22) 253,764 | 45) 7% |
|---|---|---|
| *Answers* | 23) $920.25 | 46) 2.7% |
| 1) 86.4% | 24) $51.50 | 47) 2.5% |
| 2) $40 | 25) 94% | 48) 20% |
| 3) 68° | 26) $0.94 | 49) 87% |
| 4) 40% | 27) 3.2% | 50) 10% |
| 5) 5 | 28) 20 | 51) 8 ozs |
| 6) 8/3 quarts | 29) 25% | 52) $480 |
| 7) 37% | 30) 53 | 53) 133 1/3% |
| 8) $24 | 31) 16 | 54) 8 gallons |
| 9) 11.5 hrs | 32) 78.4% | 55) 39% |
| 10) 38 | 33) 13% | |
| 11) $303.75 | 34) 89% | |
| 12) $350 | 35) 7 | |
| 13) 237.5% | 36) 20% | |
| 14) $881 | 37) 56% | |
| 15) $51.94 | 38) 24% | |
| 16) 43% | 39) $12,400 | |
| 17) $6144 | 40) 12% | |
| 18) 85% | 41) 624 in$^2$ | |
| 19) $2 | 42) 60 | |
| 20) $519,200 | 43) 89% | |
| 21) $6,000 | 44) .28 | |