1. d.Work backwards to ﬁnd the solution. George has 5 cousins, which is 11 less than Bonnie has; therefore, Bonnie has 16 cousins. Bonnie has twice as many as Robert has, so half of 16 is 8. Robert has 8 cousins.

2. c. Set up a proportion with m sod il a k ; 2 5 = 1 x 0 . Cross multiply and solve; (5)(10) = 2x. Divide both sides by 2; 5 2 0 = 2 2 x ; x = 25 sodas.

3. b.To earn an average of 93% on four tests, the sum of those four tests must be (93)(4) or 372. The sum of the ﬁrst three tests is 85 + 92 + 95 = 272. The difference between the needed sum of four tests and the sum of the ﬁrst three tests is 100. He needs a 100 to earn a 93 average.

4. c. To ﬁnd the number of boxes needed, you should divide the number of cans by 40; 320 ÷ 40 = 8 boxes.

5. d.From 10 A.M. Friday to 10 A.M. Saturday is 24 hours. Then, from 10 A.M. Saturday to 6 P.M. Saturday is another 8 hours. Together, that makes 32 hours.

6. b.Use the order of operations and try each option. The ﬁrst option results in 14 because 2 × 5 = 10, then 10 + 4 = 14. This does not work. The second option does result in 18. The numbers in parentheses are added ﬁrst and result in 9, which is then multiplied by 2 to get a ﬁnal answer of 18. Choice c does not work because the operation in parentheses is done ﬁrst, yielding 6, which is then multiplied by 5 to get a result of 30. Choice d does not work because the multiplication is done ﬁrst, yielding 8, which is added to 5 for a ﬁnal answer of 13.

7. a. Multiply the number of miles (9) by the amount pledged per mile ($0.50); 9 × 0.50 = $4.50. To multiply decimals, multiply normally, then count the number of decimal places in the problem and place the decimal point in the answer so that the answer has the same number of decimal places as the problem.

8. d.To ﬁnd the square root () you ask yourself, “What number multiplied by itself gives me 36?” 6 × 6 = 36; therefore, 6 is the square root of 36.

9. c. Mr. Brown plows 6 acres an hour, so divide the number of acres (21) by 6 to ﬁnd the number of hours needed; 21 ÷ 6 = 3.5 hours.

10. d.This is the only answer choice that has only PRIME numbers. A prime number is a number with two and only two distinct factors. In choice a, 42 is not prime. In choice b, 4 and 6 are not prime. In choice c, 6 is not prime.

11. c. 25 = 2 × 2 × 2 × 2 × 2 = 32

12. b.Visualize a number line. The distance from −4 to 0 is 4. Then, the distance from 0 to 63 is 63. Add the two distances together to get 67; 63 + 4 = 67.

13. d.Exceeded means “gone above.” Therefore, if they exceeded their goal of $9,500 by $2,100, they went over their goal by $2,100; $9,500 + $2,100 = $11,600. If you chose a, you subtracted $2,100 from $9,500 instead of adding the two numbers.

14. a. Subtract Mt. Kilimanjaro’s height from Mt. Everest’s height; 29,028 − 19,340 = 9,688. If you chose b, you did not borrow correctly when subtracting.

15. a. To ﬁnd the area of a square, you multiply the length of a side by itself, because all the sides are the same length. What number multiplied by itself is 64? 8 × 8 = 64.

16. b.Subtract the number of students present from the total number in the class to determine how many students are missing; 26 − 21 = 5.

17. c. Divide the money raised by three to ﬁnd the amount each charity will receive; $1,569 ÷ 3 = $523.

18. d.Find the number of points scored on two-point baskets by multiplying 2 × 10; 20 points were scored on two-point baskets. Find the number of points scored on three point baskets by multiplying 3 × 2; 6 points were scored on three-point baskets. The total number of points is the sum of these two totals; 20 + 6 = 26.

19. a. From 2:15 P.M. to 4:15 P.M. is 2 hours. Then, from 4:15 P.M. to 4:45 P.M. is another half hour. This is a total of 2.5 hours.

20. b.There is a 1 in 6 chance of rolling a 5 because there are 6 possible outcomes on a die, but only 1 outcome is a 5.

21. a. Find the rate at which Susan is traveling by dividing her distance by time; 114 ÷ 2 = 57 mph. To ﬁnd out how long it will take her to travel 285 miles, divide her distance by her rate; 285 ÷ 57 = 5 hours.

22. d.Divide the miles by the time to ﬁnd the rate; 3,060 ÷ 5 = 612 mph.

23. c. He spent $72 on pants (3 × $24 = $72) and $90 on shirts (5 × $18 = $90). Altogether he spent $162 ($72 + $90 = $162). If you chose a, you calculated the cost of ONE pair of pants plus ONE shirt instead of THREE pants and FIVE shirts.

24. b.There are 100 cm in a meter. A square meter is 100 cm by 100 cm. The area of this is 10,000 sq cm (100 × 100 = 10,000).

25. a. There are 36 inches in a yard; 4 × 36 = 144 inches. There are 144 inches in 4 yards.

26. c. To ﬁnd the number of hours needed to burn 750 calories, divide 750 by 500; 750 ÷ 500 = 1.5 hours.

27. b.Visualize a number line. The drop from 31° to 0° is 31°. There are still 9 more degrees to drop. They will be below zero. −9°F is the temperature at midnight.

28. a. Divide the total sales ($1,260) by the number of tickets sold (210) to ﬁnd the cost per ticket; $1,260 ÷ 210 = $6.

29. c. A 10 second count is 1 6 of a minute. To ﬁnd the number of beats per minute, multiply the beat in 10 seconds by 6; 11 × 6 = 66 beats per minute.

30. c. The probability of heads does not change based on the results of previous ﬂips. Each ﬂip is an independent event. Therefore, the probability of getting heads is 1 2 .

31. b.To ﬁnd the median, ﬁrst put the numbers in order from least to greatest. 56, 72, 87, 89, 93. The middle number is the median. 87 is in the middle of the list, therefore, it is the median. If you chose a, you forgot to put the numbers in order before ﬁnding the middle number.

32. a. List the factors of 24 and 64. The largest factor that they have in common is the greatest common factor. Factors of 24: 1, 2, 3, 4, 6, 8, 12, 24 Factors of 64: 1, 2, 4, 8, 16, 32, 64 The largest number that appears in both lists is 8.

33. d.Find the total number of slices by multiplying 3 by 8 (3 × 8 = 24). There are 24 slices to be shared among 12 coworkers. Divide the number of slices by the number of people to ﬁnd the number of slices per person; 24 ÷ 12 = 2 slices per person.

34. a. Divide the number of people by the number that ﬁt on a bus; 125 ÷ 48 = 2.604. They need more than 2 buses, but not quite 3. Since you can’t order part of a bus, they will need to order 3 buses.

35. d.Change all the answer choices to their decimal equivalents. Choice a is still 0.6; choice b is 0.6; choice c is 0.6 (3 ÷ 5); choice d is 0.06; 0.06 is not equivalent to the other numbers.

36. b.Lance has 70 cents. Three-fourths of a dollar is 75 cents, so Margaret has 75 cents. Guy has 60 cents (25 + 25 + 10 = 60). Bill has 60 cents (6 × 10 = 60). Margaret has the most money.

37. b.Finding what 100 students would say is the same as ﬁnding the percent, because percent means “out of 100.” To ﬁnd the percent, divide the number of students who said a dog was their favorite (258) by the total number of students surveyed (430); 258 ÷ 430 = 0.6. Change 0.6 to a percent by moving the decimal two places to the right. 60%. This means that 60 out of 100 students would say dog.

38. c. Divide the bill by 5; $53.75 ÷ 5 = $10.75. They each pay $10.75.

39. d.Find how much it depreciates over one year by dividing the cost by 5; $2,100 ÷ 5 = $420. Multiply this by 2 for two years; $420 × 2 = $840. It will have depreciated $840.

40. b.Add the test grades (96 + 74 + 85 = 255) and divide the sum by the number of tests (255 ÷ 3 = 85). The average is 85%.

41. b.Find the total number of people and the total number of cars. Then, divide the total people by the total cars. People: 57 × 4 = 228 61 × 2 = 122 9 × 1 = 9 5 × 5 = 25 TOTAL 384 people Cars: 57 + 61 + 9 + 5 = 132 384 ÷ 132 = 2.9 which is rounded up to 3 people because 2.9 is closer to 3 than it is to 2.

42. c. Find the number of gallons per second by dividing 750 by 50 (750 ÷ 50 = 15 gallons per second). Divide 330 gallons by 15 to ﬁnd how many seconds it will take (330 ÷ 15 = 22 seconds). It will take 22 seconds.

43. c. Divide 405 by 45 to get 9 minutes.

44. c. Find the probability of each event separately, and then multiply the answers. The probability of rolling a 3 is 1 6 and the probability of tossing a tail is 1 2 . To ﬁnd the probability of both of them happening, multiply 1 6 × 1 2 = 1 1 2 . The probability is 1 1 2 .

45. c. Multiply the number of choices for each item to ﬁnd the number of combinations (5 × 8 = 40). There are 40 combinations.

46. c. There are 12 inches in a foot. Divide 150 by 12 to ﬁnd the number of feet; 150 ÷ 12 = 12.5 feet.

47. a. One cup is 8 ounces, so half a cup is 4 ounces. Multiply 25 by 4 ounces to ﬁnd the number of ounces needed; 25 × 4 = 100 ounces.

48. c. There are 16 ounces in a pound. If Justin gains 8 ounces he will be 8 pounds and 20 ounces. The 20 ounces is 1 pound and 4 ounces. Add this to the 8 pounds to get 9 pounds and 4 ounces.

49. c. Divide the width (85 cm) by 2.54 to ﬁnd the number of inches; 85 ÷ 2.54 = 33.46 inches. The question says to round to the nearest tenth (one decimal place), which would be 33.5 inches.

50. b.The probability of blue is t b o l t u a e l . The number of blue marbles is 6, and the total number of marbles is 16 (3 + 6 + 5 + 2 = 16). Therefore, the probability of choosing a blue is 1 6 6 = 3 8 .

51. c. First, put the numbers in order from least to greatest, and then ﬁnd the middle of the set. 2, 2, 3, 3, 4, 4, 5, 6, 6 The middle is the average (mean) of the 5th and 6th data items. The mean of 4 and 4 is 4.

52. d.A chart like the one below can be used to determine which days Max and Ellen go to the gym. The ﬁrst day after Monday that they both go—Saturday—is the answer. Today next day they are both at the gym, S M Tu W Th F S M,E E M,E M E M,E

53. a. 200 − 300 = −100 points

54. b.Move the decimal point 4 places to the right to get 35,000.

55. a. Eleven games are accounted for with the losses and ties (9 + 2 = 11). The remainder of the 25 games were won. Subtract to ﬁnd the games won; 25 − 11 = 14 games won.

56. b.If the temperature is only 4° and drops 9°, it goes below zero. It drops 4° to zero and another 5° to −5°F.

57. d.Each number is divided by 2 to ﬁnd the next number; 40 ÷ 2 = 20. Twenty is the next number.

58. a. Nine is NOT prime because it has 3 factors; 1, 3, and 9. Prime numbers have only 2 factors.

59. b.The correct order of operations must be used here. PEMDAS tells you that you should do the operations in the following order: Parentheses, Exponents, Multiplication and Division—left to right, Addition and Subtraction—left to right. 9 − 22 = 9 − 4 = 5 a is (1 + 2)2 = (3)2 = 9 c is 11 − 10 × 5 = 11 – 50 = − 39 d is 45 ÷ 3 × 3 = 15 × 3 = 45, 5° 4° 3° 2° 1° 0° −1° −2° −3° −4° −5° −6°

60. d.See the diagram below. They are 4 blocks east of the hotel.

61. b.Divide $350 by $25; 350 ÷ 25 = 14 weeks.

62. b.Multiply $115 by 12 because there are 12 months in a year; $115 × 12 = $1,380 per year.

63. a. Use a proportion comparing boys to girls at the dance. g b i o r y l s s , 3 4 = 6 x 0 Solve the proportion by cross-multiplying, setting the cross-products equal to each other and solving as shown below. (3)(60) = 4x 180 = 4x, 18 4, 0 = 4 4 x 45 = x There were 45 boys.