64. d.To ﬁnd the average, add the miles run each day and divide by the number of days. To add the fractions use a common denominator of 4; 52 4 + 61 4 + 42 4 + 23 4 = 178 4 = 17 + 2 = 19. Divide the sum by 4; 19 ÷ 4 = 43 4 .

65. b.Subtract to ﬁnd the difference in heights. You will need to borrow 1 whole from 65 and add it to 1 4 to make the fractional part of the mixed number 5 4 . 651 4 − 603 4 = 645 4 − 603 4 = 42 4 = 41 2 . If you chose a, you did not borrow and simply subtracted the smaller fraction from the larger fraction.

66. c. Add the times together to ﬁnd the total amount of time. Remember that he walks the dog twice and feeds the dog twice. The common denominator is 12. 3 4 + 3 4 + 1 6 + 1 6 = 1 9 2 + 1 9 2 + 1 2 2 + 1 2 2 = 2 1, 2 2 = 1 1 1, 0 2 = 15 6 If you chose a, you did not consider that he walks and feeds the dog TWICE a day.

67. a. Subtract the number of pages of advertisements from the total number of pages. Use a common denominator of 8 and borrow one whole (8 8 ) from 16 to do the subtraction. 16 − 33 8 = 158 8 − 33 8 = 125 8

68. c. If Lisa has read 3 4 of the assignment, she has 1 4 left to go. To ﬁnd 1 4 of a number, divide the number by 4; 64 ÷ 4 = 16 pages. If you chose a, you found the number of pages that she already read.

69. b.Ignore the fractional parts of the mixed numbers at ﬁrst and multiply the whole number portion of the ounces by the corresponding number of cans; 4 × 3 = 12 ounces and 8 × 5 = 40 ounces. Adding together 12 and 40, you get a total of 52. Next, ﬁnd the fractional portion. By multiplying the fractional part by the corresponding number of cans; 1 2 × 3 = 3 2 = 11 2 ounces and 1 4 × 5 = 5 4 = 11 4 ounces. Add together these fractional parts 11 2 + 11 4 = 23 4 . Add this answer to the answer from the whole numbers to get the ﬁnal answer; 23 4 + 52 = 543 4 ounces. If you chose a, you did not consider that he has THREE of the smaller cans and FIVE of the larger cans.

70. b.To ﬁnd the total distance walked, add the three distances together using a common denominator of 12; 2 1 6 2 + 1 4 2 + 1 1 3 2 = 3 1 1 3 2 which is simpliﬁed to 4 1 1 2 .

71. c. First, ﬁnd the fraction of the book that he has read by adding the three fractions using a common denominator of 24; 2 3 4 + 2 8 4 + 2 6 4 = 1 2 7 4 . Subtract the fraction of the book he has read from one whole, using a common denominator of 24; 2 2 4 4 − 1 2 7 4 = 2 7 4 . If you chose d, you found the fraction of the book that Justin had already read.

72. d.Multiply the hours babysat by the charge per hour. Change the mixed number to an improper fraction before multiplying; 9 2 × 7 1 = 6 2 3 simpliﬁes to 311 2 or $31.50.

73. a. Subtract the miles completed from the total number of miles they need to paint. Use a common denominator of 15. 54 1 1 0 5 − 23 1 3 5 = 31 1 7 5

74. b.Change the answer choices to mixed numbers to compare them to 11 2 ; 3 2 1 0 = 1 1 2 1 0 , which is larger than 11 2 because the numerator (11) is more than half the denominator (20).

75. a. Find the uneaten part of the cake by subtracting the eaten part from one whole; 3 7 of the cake was uneaten. To ﬁnd half of this amount, multiply by 1 2 ; 3 7 × 1 2 = 1 3 4 .

76. b.An hour is 60 minutes. To ﬁnd the number of minutes in 5 6 of an hour, multiply 60 by 5 6 ; 6 1 0 × 5 6 = 30 6 0 = 50 minutes.

77. b.Divide the 6-minute block by 3 4 , remembering to take the reciprocal of the second fraction, and multiply; 6 ÷ 3 4 = 6 1 × 4 3 = 2 3 4 = 8.

78. d.To compare the fractions, use the common denominator of 40. Therefore, Betty = 3 4 0 0 , Susan = 1 4 6 0 , Mike = 2 4 5 0 , and John = 2 4 0 0 . To order the fractions, compare their numerators.

79. d.If 5 6 of the time was spent on the highway, 1 6 was not. To ﬁnd 1 6 of 12 hours, multiply the two numbers; 1 6 × 1 1 2 = 1 6 2 = 2 hours.

80. c. To ﬁnd the amount of time that it took the Grecos, divide the distance (83 4 ) by the rate (31 2 ). To divide mixed numbers, change them to improper fractions, then take the reciprocal of the second fraction and multiply;

81. d.To ﬁnd 2 5 of $32 million, multiply the two numbers; 2 5 × 3 1 2 = 6 5 4 which simpliﬁes to $124 5 million.

82. c. To ﬁnd 4 5 of 365 days, multiply the two numbers; 4 5 × 36 1 5 = 1,4 5 60 , which simpliﬁes to 292 days.

83. d.Add the needed lengths together using a common denominator of 4; 122 4 + 71 4 + 71 4 = 264 4 , which simpliﬁes to 27 inches.

84. c. Add the weights together using a common denominator of 12; 3 1 3 2 + 8 1 6 2 + 4 1 8 2 = 15 1 1 7 2 , which simpliﬁes to 16 1 5 2 lb.

85. c. Add all four sides of the garden together to ﬁnd the perimeter. 41 2 + 41 2 + 3 + 3 = 142 2 , which simpliﬁes to 15 yards. If you chose b, you added only TWO sides of the garden.

86. a. Divide the number of packages of cheese (12) by 1 3 to ﬁnd the number of pizzas that can be made. Remember to take the reciprocal of the second number and multiply; 1 1 2 ÷ 1 3 = 1 1 2 × 3 1 = 3 1 6 , which simpliﬁes to 36. If you chose b, you multiplied by 1 3 instead of dividing.

87. b.Multiply the number of yards purchased by the cost per yard. Change the mixed number into an improper fraction; 7 2 × 2 1 5 = 17 2 5 , which reduces to 871 2 or $87.50.

88. a. Add the two plots of land together using a common denominator of 12; 2 1 9 2 + 1 1 4 2 = 3 1 1 3 2 , which simpliﬁes to 4 1 1 2 acres.

89. d.Divide the amount of money Lucy made by the number of hours she worked. Change the mixed number to an improper fraction. When dividing fractions, take the reciprocal of the second number and multiply; 195 ÷ 321 2 = 19 1 5 ÷ 6 2 5 = 19 1 5 × 6 2 5 = 3 6 9 5 0 , which simpliﬁes to $6.

90. a. To ﬁnd the area, multiply the length by the width. When multiplying mixed numbers, change the mixed numbers to improper fractions; 41 2 × 61 2 = 9 2 × 1 2 3 = 11 4 7 , which simpliﬁes to 291 4 sq ft.

91. a. Add the number of hours together using a common denominator of 60; 4 3 6 0 0 + 3 4 6 5 0 + 8 1 6 2 0 + 1 2 6 0 0 = 16 1 6 0 0 7 , which simpliﬁes to 17 4 6 7 0 hours.

92. a. First, multiply 3 by 1 2 to ﬁnd the time taken by the three half-minute commercials; 3 × 1 2 = 3 2 . Then, multiply 1 4 by 5 to ﬁnd the time taken by the ﬁve quarter-minute commercials; 1 4 × 5 = 5 4 . Add the two times together to ﬁnd the total commercial time. Use a common denominator of 4; 6 4 + 5 4 = 1 4 1 , which simpliﬁes to 23 4 minutes. If you chose b, you only calculated for ONE commercial of each length rather than THREE 1 2 minute commercials and FIVE 1 4 minute commercials.

93. b.Multiply the number of Saturday dinners (715) by 2 5 to ﬁnd the number of dinners served on Monday; 71 1 5 × 2 5 = 1,4 5 30 , which simpliﬁes to 286 dinners.

94. c. Multiply the amount of brown sugar needed for one batch (3 4 ) by the number of batches (3); 3 4 × 3 1 = 9 4 , which simpliﬁes to 21 4 cups.

95. b.Since the numerator is larger than the denominator, the fraction is greater than 1.

96. c. The prize money is divided into tenths after the ﬁrst third has been paid out. Find one third of $2,400 by dividing $2,400 by 3; $800 is paid to the ﬁrst winner, leaving $1,600 for the next ten winners to split evenly ($2,400 − $800 = $1,600). Divide $1,600 by 10 to ﬁnd how much each of the 10 winners will receive; $1,600 ÷ 10 = $160. Each winner will receive $160.

97. a. The entire company is one whole or 8 8 . Subtract 3 8 from the whole to ﬁnd the fraction of the company that is not in accounting; 8 8 − 3 8 = 5 8 . Recall that you subtract the numerators and leave the denominators the same when subtracting fractions; 5 8 is equivalent to 1 1 0 6 .

98. b.If Kyle eats 8 cookies, 28 cookies are left (36 − 8 = 28). The part that is left is 28, and the whole is 36. Therefore, the fraction is 2 3 8 6 . Both the numerator and denominator are divisible by 4. Divide both parts by 4 to simplify the fraction to 7 9 .

99. d.Find 1 8 of 12 gallons by multiplying; 1 8 × 1 1 2 = 1 8 2 . Recall that 12 is equivalent to 12 over 1. To multiply fractions, multiply the numerators and multiply the denominators. Change 1 8 2 to a mixed number; 8 goes into 12 once, so the whole number is 1. Four remains, so 4 8 or 1 2 is the fractional part; 11 2 gallons are left.

100. a. Compare 3 4 , 3 5 , 2 3 , 2 5 by ﬁnding a common denominator. The common denominator for 3, 4, and 5 is 60. Multiply the numerator and denominator of a fraction by the same number so that the denominator becomes 60. The fractions then become 4 6, 5 0 , 3 6, 6 0 , 4 6, 0 0 , 2 6, 4 0 . The fraction with the largest numerator is the largest fraction; 4 6, 5 0 is the largest fraction. It is equivalent to Joey’s fraction of 3 4 .

101. b.Break the circle into sixths as shown below; 3 of the sixths are shaded which is equivalent to 3 6 which is 1 2 .

102. d.To triple the recipe, multiply by 3; 12 3 × 3 = 5 3 × 3 1 = 1 3 5 = 5. When multiplying a mixed number, change it to an improper fraction ﬁrst. To ﬁnd the numerator of the improper fraction, multiply the whole number by the denominator and add the product to the numerator. Keep the denominator the same.

103. c. Break the block into equal regions as shown below; 3 out of the 8 blocks are shaded. This corresponds to the fraction 3 8 .

104. d.Add the two pieces of land together; 13 4 + 23 4 = 36 4 . Add the whole numbers. Since the denominators are already the same, just add the numerators and keep the denominator the same; 6 4 can be simpliﬁed to 12 4 or 11 2 . Add this to the whole number to get 41 2 acres.

105. a. Ten of the 16 blocks are shaded. This is represented by the fraction 1 1, 0 6 . Both the numerator and the denominator can be divided by 2 to simplify the fraction. This yields 5 8 .

106. c. Every whole has 8 eighths. Since there are 8 eighths in each of the 4 wholes, there are 32 eighths in the whole number portion. There are 3 eighths in the fraction portion. Adding the two parts together, you get 35 eighths (32 + 3 = 35).

107. c. To double the recipe, multiply by 2; 2 3 × 2 = 2 3 × 2 1 = 4 3 . Recall that 2 can be written as 2 1 ; 4 3 is an improper fraction. To change it to a mixed number, determine how many times 3 goes into 4. It goes in one time, so the whole number is 1. There is one third left over, so the mixed number is 11 3 .

108. d.Divide Mr. Johnson’s land by two, which is the same as multiplying by 1 2 ; 43 4 × 1 2 = 1 4 9 × 1 2 = 1 8 9 = 23 8 acres. In the second step of the multiplication, 43 4 was changed to an improper fraction, 1 4 9 . And in the last step, the improper fraction 1 8 9 was converted to a mixed number.

109. a. To get from 3 5 to 1 6 5 the numerator was multiplied by 2 and the denominator by 3. This does not give you an equivalent fraction. In order for the fractions to be equivalent, the numerator and denominator must be multiplied by the same number. Choice b is equivalent because 3 ÷ 5 = 0.6. Choice c is equivalent because the numerator and denominator of 3 5 have both been multiplied by 5. Choice d is equivalent because 3 ÷ 5 = 0.60, which is equivalent to 60%.

110. b.The part of their goal that they have raised is $2,275 and the whole goal is $3,500. The fraction for this is 2 3 , , 2 5 7 0 5 0 . The numerator and denominator can both be divided by 175 to get a simpliﬁed fraction of 1 2 3 0 . They have completed 1 2 3 0 of their goal, which means that they have 2 7 0 left to go ( 2 2 0 0 − 1 2 3 0 = 2 7 0 ).

111. c. Refer to the drawing below. If half is broken into thirds, each third is one sixth of the whole. Therefore, she has 2 6 or 1 3 of the pizza left.

112. d.The easiest way to determine which fraction is closest to 1 2 is to change each of them to a decimal and compare the decimals to 0.5 which is equivalent to 1 2 . To ﬁnd the decimal equivalents, divide the numerator by the denominator. 2 3 = 0.66 , 1 7 0 = 0.7, 5 6 = 0.83, 3 5 = 0.6 The decimal closest to 0.5 is 0.6. Therefore, 3 5 is closest to 1 2 .

113. b.Multiply 120 by 2 3 . Thus, 12 1 0 × 2 3 = 24 3 0 = 80; 120 is written as a fraction with a denominator of 1. The fraction 24 3 0 is simpliﬁed by dividing 240 by 3 to get 80 cups. eaten last night, left over, eaten for breakfast

114. b.Use a proportion comparing gallons used to time. The plane uses 91 2 gallons in 1 hour and the problem asks how many hours it will take to use 61 3 gallons. To solve the proportion for x, cross multiply, set the cross-products equal to each other and solve as shown below. (91 2 )x = (61 3 )(1) = To divide the mixed numbers, change them into improper fractions. x = x = 1 3 9 ÷ 1 2 9 x = 1 3 9 × 1 2 9 The 19s cancel. Multiply the numerators straight across and do the same for the denominators. The ﬁnal answer is 2 3 hour.

115. a. There are 12 inches in a foot; 3 4 of a foot is 9 inches (3 4 × 12 = 9). The length of the room is 12 feet 9 inches.

116. c. Multiply $15,500,000 by 2 5 ; 15,50 1 0,000 × 2 5 = 31,00 5 0,000 = $6,200,000

117. b.Every 1 4 inch on the map represents 150 miles in real life. There are 4 fourths in every whole (4 × 3 = 12) and 2 fourths in 1 2 for a total of 14 fourths (12 + 2 =14) in 31 2 inches. Every fourth equals 150 miles. Therefore, there are 2,100 miles (14 × 150 = 2,100).

118. d.The width of the opening of the frame is 8 inches. The painting only ﬁlls 41 2 inches of it. There is an extra 31 2 inches (8 − 41 2 = 31 2 ) to be ﬁlled with the mat. There will be an even amount of space on either side of the painting. So, divide the extra space by 2 to ﬁnd the amount of space on each side; 31 2 ÷ 2 = 1 3 4 inches. To divide a mixed number by a whole number, change the mixed number to an improper fraction; 31 2 becomes 7 2 . Also, change 2 to a fraction (2 1 ). Then take the reciprocal of 2 and multiply; 7 2 × 1 2 = 7 4 = 13 4 inches.

119. b.Divide 1 2 pound by 3. Recall that 3 can be written as 3 1 ; 1 2 ÷ 3 1 . When dividing fractions, take the reciprocal of the second fraction and multiply; 1 2 × 1 3 = 1 6 pound of jellybeans.

120. d.Multiply 11 2 by 10. Change 11 2 to an improper fraction (3 2 ) and make 10 into a fraction by placing it over 1 ( 1 1 0 ); 3 2 × 1 1 0 = 3 2 0 = 15 feet. Each side is 15 feet long, so the dimensions are 15 ft by 15 ft.

121. a. Divide 10 by 2 3 . Recall that 10 can be written as 1 1 0 ; 1 1 0 ÷ 2 3 . When dividing fractions, take the reciprocal of the second fraction and multiply; 1 1 0 × 3 2 = 3 2 0 = 15 bows. If you can’t ﬁgure out what operation to use in this problem, consider what you would do if you had 10 yards of ribbon and each bow took 2 yards. You would divide 10 by 2. This is the same for problem 121, except that the bow takes a fraction of a yard.

122. a. Multiply 3 4 by 1 2 to ﬁnd half of the land; 3 4 × 1 2 = 3 8 acre.

123. b.Subtract Friday’s price from Monday’s price; 263 8 − 24 1 3 6 . In order to subtract, you need a common denominator. The common denominator is 16. Multiply the ﬁrst fraction by 2 in the numerator and 2 in the denominator 3 8 × × 2 2 = 1 6 6 . Then subtract; 26 1 6 6 − 24 1 3 6 = 2 1 3 6

124. d.Determine what number 7 was multiplied by to get 42 and multiply the numerator by the same number. Seven was multiplied by six, so 3 × 6 = 18. The value of x is 18.

125. c. Multiply the cost per acre by the number of acres; $60,000 × 13 4 . Change 60,000 to a fraction by putting it over 1 and change the mixed number to an improper fraction; 60, 1 000 × 7 4 = 420 4 000 = $105,000