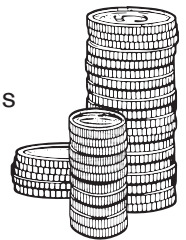




# Warm-Up 1

31. \_\_\_\_\_ The scores for the Math Competition Team at Artemis Middle School were 14, 19, 22, 9, 17, 15, 22, 30, 2 and 8. What is the absolute difference between the median and range of these scores?
32. \_\_\_\_\_ If  $4g + 12 = 28g$ , what is the value of  $100g$ ?
33. \$ \_\_\_\_\_ Theo had \$75 when he started shopping. After paying \$3.50 for an ice cream cone, \$8.00 each for two bouquets of roses, and \$8.25 for a bag of gumballs, how much money does Theo have left?
34. \_\_\_\_\_ minutes Lisha is mowing lawns. She takes a break between each lawn she mows and the next, and the lengths of all breaks are the same. She starts mowing the first lawn at 10:00 a.m. and finishes her fourth lawn at 2:00 p.m. The first lawn takes 75 minutes to mow, the second lawn takes 30 minutes to mow, and the third and fourth lawns each take 45 minutes to mow. How many minutes long is each break?
35. \$ \_\_\_\_\_ Seven quarters are worth how much more than seven nickels?
36. \_\_\_\_\_ % Esra is playing an online multiplayer puzzle game. He has a 90% chance of winning any given match, independent of his results on previous matches. If he plays two matches, what is the percent probability that he wins them both?
37. \_\_\_\_\_ degrees In isosceles triangle LMN, only angle L measures 68 degrees. What is the degree measure of angle M?
38. \_\_\_\_\_ feet & wings There are 15 goats and 23 ducks in a barnyard. If each goat has four feet and each duck has two feet and two wings, what is the total number of feet and wings?
39. \_\_\_\_\_ coins Using only quarters, dimes and nickels, what is the least number of coins you can use to make \$2.40?
40. \_\_\_\_\_ % What percent of 25 is 8?





# Warm-Up 2

41. \_\_\_\_\_ Two numbers have a sum of 11 and a product of 24. What is the sum of the reciprocals of the two numbers? Express your answer as a common fraction.


42. \_\_\_\_\_  $\text{cm}^3$  What is the volume of a sphere with radius 6 cm? Express your answer in terms of  $\pi$ .

43. \_\_\_\_\_ What is the value of  $\frac{\sqrt{81} + \sqrt{144} + \sqrt{400}}{\sqrt{81+144+400}}$ ? Express your answer as a common fraction.

44. \_\_\_\_\_ What is the value of  $\frac{75!}{73!} \times \frac{72!}{74!}$ ? Express your answer as a common fraction.


45. \_\_\_\_\_ What is the sum of the coordinates of the  $y$ -intercept of the line given by the equation  $y = 3.2x - 7$ ?

46. \_\_\_\_\_  $\text{cm}$  What is the absolute difference between the circumferences of a circle with radius 7 cm and one with radius 9 cm? Express your answer in terms of  $\pi$ .

47. \_\_\_\_\_  $\text{plants}$   If each cherry tomato plant produces  $4\frac{1}{2}$  dozen tomatoes over the summer, what is the minimum number of plants needed to produce at least 1000 cherry tomatoes?

48. \$ \_\_\_\_\_ At a garage sale, Jinna bought an antique dollhouse for \$450 and furnishings for six rooms of the dollhouse for \$17 per room. Finally, the cost of a family of miniature dolls to live in the dollhouse was \$24. If she paid for her purchase with six \$100 bills, how much change did Jinna receive?

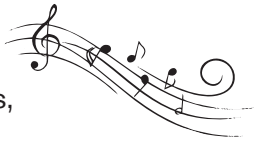




49. \_\_\_\_\_  $\text{ounces}$   Every guest at Omar's birthday brunch drank the same amount of orange juice. Omar had three 64-ounce containers of orange juice. If there were 24 guests at Omar's birthday brunch, and all the orange juice was consumed, how many ounces of orange juice did each guest drink?

50. \_\_\_\_\_  $\text{cm}$  A rectangle has side lengths of 6 cm and 4 cm. When its side lengths are doubled, how many centimeters longer is its new perimeter than its original perimeter?



# Warm-Up 3

51. \_\_\_\_\_  $\text{cm}^3$  The sum of the lengths of all edges of a cube is 60 cm. What is the volume of the cube?
52. \_\_\_\_\_  $\frac{\text{years}}{\text{old}}$  Two years from now, Mr. Whiskers will be twice as old as he was five years ago. How old is Mr. Whiskers now?
53. \_\_\_\_\_  $\text{seconds}$  Kousei plays a collection of 27 short pieces on the piano. If he can play the entire collection in 1 hour 12 minutes, then how many seconds, on average, does he take to play a single one of the pieces?
- 
54. \_\_\_\_\_  $\text{terms}$  How many terms does  $3x^3 + 2x - 7x^2 + 8 - 9x^3 + 3 + 5x^2 + 11x^3 - 2 + 5x + 2x^2 + 6x^3$  have after like terms are combined?
55. \_\_\_\_\_ The positive integer  $m$  is one-fifth of the positive integer  $n$ , and  $n - m = 28$ . What is the value of  $m + n$ ?
56. \_\_\_\_\_  $\frac{\text{gold}}{\text{doubloons}}$  Each of eight treasure chests contains at least 100 gold doubloons. Each treasure chest holds a different number of gold doubloons, except for two chests that contain the same number of doubloons. What is the smallest total number of gold doubloons the eight treasure chests could contain?
- 
57. \_\_\_\_\_ What is the slope of a line parallel to a line with the equation  $6x - y = 7$ ?
58. \_\_\_\_\_  $\text{miles}$   If 2.25 inches on a map represents 360 miles, how many miles does 1.375 inches represent?
59. \_\_\_\_\_ What is  $\frac{1}{3}$  of  $\frac{1}{4}$  of  $\frac{1}{5}$  of  $\frac{1}{6}$  of 180? Express your answer as a common fraction.
60. \_\_\_\_\_  $\text{meters}$  The difference between the circumferences of two circles is  $50\pi$  meters. What is the absolute difference between the radii of the two circles?

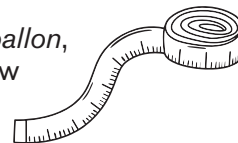


# Warm-Up 4

61. \_\_\_\_\_ If  $a$  &  $b = 2a + b^2$ , then what is the value of  $4$  &  $6$ ?

62. prob-  
lems If each Mathlete solves, on average, 30 problems in 40 minutes, then how many problems will 12 Mathletes solve in an hour?

63. luftballons Nena has invented a new and unusual unit of distance known as the *luftballon*, defined to be exactly 640 inches. If there are 5280 feet in a mile, then how many luftballons are there in a mile?



64. raffle  
tickets



A middle school band sold raffle tickets to raise money. Tickets sold for \$5 each, and the net profit from ticket sales was \$900. If the only expense was the \$150 prize, how many raffle tickets were sold?

65. yats If 2 yats are equal to 3 yots, 4 yits are equal to 7 yuts, and 2 yuts are equal to 5 yots, how many yats are equal to 12 yits?

66. \_\_\_\_\_ What is the sum of the digits of the product  $11 \times 111 \times 11,111$ ?

67. questions Venus was asked to solve 50 questions on a math test. She earned 5 points for each question she solved correctly. Three points were subtracted for each question solved incorrectly. Venus answered all 50 questions and earned a score of 186 points. How many questions did Venus answer correctly?

68. values Let  $n$  represent a mystery three-digit number whose digits have a sum of 15. If the hundreds digit is a perfect square number, how many possible values are there for  $n$ ?

69. km



Pablo walked around a 400-meter track at his school 3 times each day of May, June, July and August. How many kilometers in total did he walk during those months? Express your answer as a decimal to the nearest tenth.

70. % Rohan took 120 pictures on his nature hike. He sorted the pictures into categories and found 10% were pictures of trees, 5% were pictures of flowers, 18 were pictures of insects, 45% were pictures of seashells, and 6 were pictures of birds. The remaining pictures were of rocks. If no picture belongs to more than one category, what percent of the pictures were of rocks?





# Warm-Up 5

71. \_\_\_\_\_ What number must be added to 4884 to equal the product of 48 and 84?

72. \_\_\_\_\_ floors Ammar exits his apartment on Floor 107 of the Burj Khalifa. He takes the elevator down 31 floors to the swimming pool. After a quick swim, he takes the elevator up 46 floors to the At.mosphere Restaurant. After dinner, he takes the elevator up 26 floors to the At the Top lounge. Ammar takes the elevator down 24 more floors to an observation deck. How many floors will Ammar travel to go directly to his apartment from there?



73. \_\_\_\_\_ miles A school bus driver runs three morning routes to take kids to school and two routes in the late afternoon to take kids back home. If the routes average 46 miles, how many miles will the driver cover in three 5-day weeks and one 4-day week?

74. \_\_\_\_\_ A fair, standard six-sided die is rolled twice. What is the probability that the sum of the numbers rolled is divisible by 5? Express your answer as a common fraction.

75. \_\_\_\_\_ units What is the distance between the points  $(-1, 15)$  and  $(8, -3)$ ? Express your answer to the nearest whole number.

76. \_\_\_\_\_ If  $x \# y = \frac{x-1}{y+1}$ , then what is  $(25 \# 23) \# (23 \# 25)$ ?

77. \_\_\_\_\_ What is the value of  $1 - 2 + 4 - 5 + 7 - 8 + \dots + 97 - 98 + 100$ ?

78. \_\_\_\_\_ arrange-ments How many different arrangements of the letters in the word ALGEBRA have no two consonants next to each other?

79. \_\_\_\_\_ smooth-ies At the Super Fruit Juice Smoothy company, a customer can choose from 4 types of sherbet, 8 types of juice and 10 types of fruit. If Sara chooses a sherbet, a juice and two different fruits, how many different smoothies can she create?

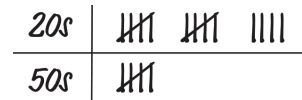


80. \_\_\_\_\_ inches A rectangle has area  $392 \text{ in}^2$ , and its length is twice its width. What is the perimeter of this rectangle?



# Warm-Up 6

81. \_\_\_\_\_ bills The chart shows the numbers of \$20 bills and \$50 bills that Jean has. If she exchanges all her bills for \$10 bills, how many more bills will she have?



82. \_\_\_\_\_ What is  $x + y + z$  if  $2x + 3y + 4z = 19$  and  $3x + 2y + z = 11$ ?

83. \_\_\_\_\_ Five students took a test on which each could earn an integer score from 0 to 100, inclusive. If the students' mean score was 88, what is the least possible score one of the students could have earned?

84. \_\_\_\_\_ degrees What is the supplement of the complement of the complement of an angle that measures 75 degrees?

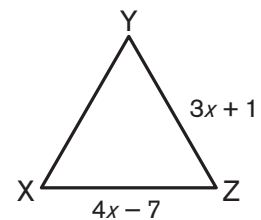
85. \_\_\_\_\_ A 2-inch by 3-inch by 3-inch right rectangular prism is painted on all faces and then cut into 1-inch by 1-inch by 1-inch cubes. The cubes are placed in a bag, and two cubes are drawn at random, without replacement. If the first cube has paint on exactly one face, then what is the probability that the second cube has paint on exactly one face? Express your answer as a common fraction.



86. \_\_\_\_\_ minutes Marc can clean a section of Gifford Park in two hours, and Nala can clean the same section of Gifford Park in three hours. How many minutes will it take Marc and Nala to clean the section of the park, working together?

87. \_\_\_\_\_ years old Ben is twice as old as Jerry. Edy is 40 years older than Ben. The sum of all their ages is 100. How old is Jerry?

88. \_\_\_\_\_ feet In equilateral triangle XYZ, shown here,  $YZ = 3x + 1$  and  $XZ = 4x - 7$ . If all the lengths given are in feet, what is XY?



89. \_\_\_\_\_

1	2	3
4	5	6
7	8	9

Starting at the center square of the grid shown, Vera travels to visit three other squares. She can only move to an adjacent square that shares a side with her current square, and she cannot visit a square more than once. What is the sum of all possible unique values of the sum of the numbers in the four squares she visits?

90. \_\_\_\_\_ candy bars

Every Nutty Delight candy bar is guaranteed to contain exactly 8 walnuts, 5 macadamia nuts and 3 pecans. The most recent batch of Nutty Delight bars used 24 more macadamia nuts than pecans. How many Nutty Delight candy bars were in that batch?



# Warm-Up 7

91. \_\_\_\_\_ orange candies A snack pack of chocolate candies contains a total of 21 candies, each in one of four colors. Five candies are brown, 3 are red, at least 2 candies are orange, and at least 2 are yellow. What is the greatest possible number of orange candies?

92. \_\_\_\_\_ Start with 12 and count by 4s to create the list 12, 16, 20, 24, ...,  $P$ , where  $P$  is the 1000th number in the list. What is the value of  $P$ ?

93. \_\_\_\_\_ books Jade's bookshelf holds a total of 105 books on three shelves. The first and second shelves hold a total of 71 books. The second and third shelves hold a total of 62 books. How many books are on the second shelf?



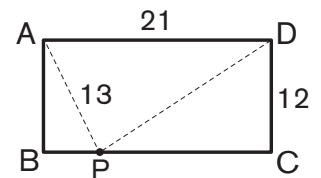
94. \_\_\_\_\_ Davi hid secret messages on five consecutive pages of his diary. He noticed that the sum of the page numbers was 150. What is the sum of the first and last of the five page numbers?

95. \_\_\_\_\_ Using only the digits 0, 1, 4 and 6, Judy lists all the possible four-digit numbers containing four distinct digits. She chooses one of the numbers at random. What is the probability that the number she chooses is divisible by 5? Express your answer as a common fraction.

96. \_\_\_\_\_ miles

Ani's house is located at the intersection of Oak and Broad streets. Cindi's house is at the intersection of Broad Street and Seaton Lane. There are two routes Ani can take from home to Cindi's house. Either she can travel 1.5 mi south on Oak Street and then continue east along Seaton Lane for 2 mi, or she can go directly to Cindi's house traveling along Broad Street. How much shorter is the direct route along Broad Street?

97. \_\_\_\_\_ feet Rectangle ABCD has  $DC = 12$  feet and  $AD = 21$  feet. If point  $P$  lies on side  $BC$  so that  $AP = 13$  feet, what is  $DP$ ?



98. \_\_\_\_\_ What is the sum of the odd positive integer divisors of 2024?

99. \_\_\_\_\_ % A collectible comic book is on sale for 80% of its list price of \$60. A vintage movie poster is on clearance for 25% of 60% of its list price of \$80. What percent of the comic book's sale price is the poster's clearance price?


100. \_\_\_\_\_  $\text{mm}^3$  A cylinder has lateral surface area  $10\pi \text{ mm}^2$  and total surface area  $28\pi \text{ mm}^2$ . What is the volume of this cylinder? Express your answer in terms of  $\pi$ .



# Warm-Up 8

101. \_\_\_\_\_ If  $\frac{x-y}{x+y} = 4$ , what is the value of  $\frac{x}{y}$ ? Express your answer as a common fraction.

102. \_\_\_\_\_ mm What is the side length of an equilateral triangle with perimeter 48 mm?

103. \$  Sora and Suki each take the same amount of money to the school carnival. Sora spends \$3 trying to dunk his principal in the dunk tank. Suki buys two orders of cotton candy for \$2.50 each. Sora spends \$7.50 to get his face painted. Together, they leave the carnival with a combined total of \$14.50. How much money did they each start with?

104. \_\_\_\_\_ What is the absolute difference between the mean and the median of the first nine prime numbers? Express your answer as a common fraction.


105. \_\_\_\_\_ points How many points with only integer coordinates lie on the line segment with endpoints (0, 0) and (70, 98)?

106. \_\_\_\_\_ If  $n$  is a positive integer and  $\sqrt{1+\sqrt{1+\sqrt{1+\sqrt{n}}}} = 2$ , what is the value of  $n$ ?

107. \_\_\_\_\_ In the multiplication table shown,  $a$ ,  $b$ ,  $c$  and  $d$  will be replaced by 2, 3, 5 and 7, with each number used exactly once. What is the greatest possible value of the sum of the four products?

$\times$	$c$	$d$
$a$		
$b$		

108. \_\_\_\_\_ What is the greatest two-digit prime number that cannot be written as the sum of two squares of positive integers?

109. \_\_\_\_\_ feet  A scale drawing of Pablo Picasso's painting *Guernica* is 51 inches long by 23 inches wide. The width of the actual painting is 11.5 feet. What is the perimeter of the actual painting?

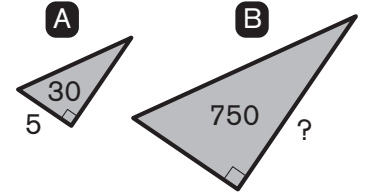
110. \_\_\_\_\_ divisors How many positive divisors does  $(2^4 + 2^4 + 2^5)(9^3 - 6^3)$  have?



# Warm-Up 9

111. \$ \_\_\_\_\_ On Sunday, January 1, Lelah put 3 quarters in her empty piggy bank. On Monday, she put 6 quarters in her piggy bank, for a total of 9 quarters. On Tuesday, Lelah put 9 quarters in the piggy bank; on Wednesday, Lelah put 12 quarters in the piggy bank. If the amount Lelah saved each day continued increasing at the same rate, how much money had she saved after adding money to the piggy bank on Sunday, January 8?

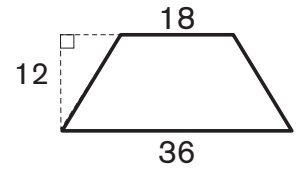
112. \_\_\_\_\_ inches The figure shows similar right triangles A and B. Triangle A has area  $30 \text{ in}^2$  and a shorter leg of length 5 inches. Triangle B has area  $750 \text{ in}^2$ . What is the length of the longer leg of triangle B?



113. \_\_\_\_\_ oyster shells Dawn collected 24 clam shells from the beach. The clam shells represent  $\frac{2}{9}$  of all the shells she collected. Periwinkle shells make up  $\frac{1}{6}$  of the shells Dawn collected. Dawn collected the same number of whelk shells as periwinkle shells, and  $\frac{1}{9}$  of the shells Dawn collected are murex shells. The rest of Dawn's shells are oyster shells. How many oyster shells does Dawn have?



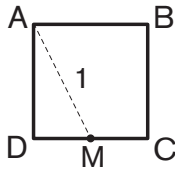
114. \_\_\_\_\_ cm What is the perimeter of an isosceles trapezoid with bases of lengths 18 cm and 36 cm and with height 12 cm?



115. \_\_\_\_\_ What integer is closest in value to  $\frac{\sqrt{950}}{\sqrt[3]{1250}}$ ?

116. \_\_\_\_\_ values Peter picks  $x$  from the set  $\{-2, 1, 2\}$  and picks  $y$  from the set  $\{-2, -1, 0, 1, 2\}$ . How many distinct values of  $x^y$  are positive?

117. \_\_\_\_\_  $\text{in}^2$  Square ABCD is shown with midpoint M on side CD. If  $AM = 1$  inch, what is the area of square ABCD? Express your answer as a common fraction.



118. \_\_\_\_\_ There are two real numbers that are twice as far from 8 on the number line as they are from 20. What is the sum of these two numbers?

119. \_\_\_\_\_ integers A three-digit positive integer is *brave* if the square of the sum of its hundreds and units digits is no larger than its tens digit. How many three-digit positive integers are brave?

120. \_\_\_\_\_ Rectangle WXYZ has  $WX = 10 \text{ cm}$  and  $XY = 5 \text{ cm}$ . Point P lies outside WXYZ so that the area of triangle WPX is  $20 \text{ cm}^2$  and the area of triangle YPZ is  $45 \text{ cm}^2$ . What is the least possible value of  $WP^2 + XP^2$ ?



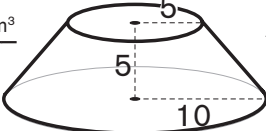
# Warm-Up 10

121. \_\_\_\_\_ problems The Borges Triplets solved 100 logic problems. Haley solved three times as many problems as Ella. Camila solved 16 more problems than Haley. How many more problems than Ella did Camila solve?

122. \_\_\_\_\_ The product of the sum and the difference of two integers is 35. What is the difference between the squares of the two integers?

123. \_\_\_\_\_ If  $\frac{x+1}{x-1} = 13$ , what is the value of  $\frac{x+2}{x-1}$ ?

124. \_\_\_\_\_ Gabriel tosses a fair coin six times. What is the probability the coin comes up heads a prime number of times? Express your answer as a common fraction.

125. \_\_\_\_\_  $\text{cm}^3$   A frustum has height 5 cm and base radii of 10 cm and 5 cm. What is its volume? Express your answer as a common fraction in terms of  $\pi$ .

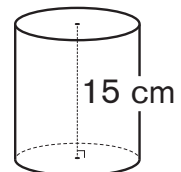
126. \_\_\_\_\_ students The 465 students in Snackwood Public School like pie, cake and doughnuts. If 230 students like at most two of these snacks and 285 like at least two of these snacks, how many students like exactly two of the snacks?



127. \_\_\_\_\_ What is the value of  $b$  if the points  $(-4, 11)$ ,  $(0, b)$  and  $(8, -13)$  are collinear?

128. \_\_\_\_\_ What is the greatest integer value of  $n$  such that  $2^n$  is less than each of  $16^7$ ,  $8^9$  and  $4^{13}$ ?

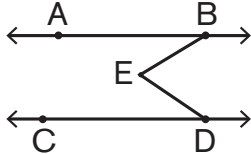


129. \_\_\_\_\_  $\text{cm}$  A right cylinder has volume  $960\pi \text{ cm}^3$  and a height of 15 cm. What is the greatest distance from the center of one base to any point on the cylinder?



130. \_\_\_\_\_ What is the geometric mean of the first five perfect fifth powers?



# Warm-Up 11

131. \_\_\_\_\_ A bag contains one red chip, two blue chips, and three white chips. Two chips are randomly drawn from the bag, without replacement. What is the probability that there will be at least one chip of each color in the bag after the two chips are drawn? Express your answer as a common fraction.
132. \_\_\_\_\_  $\frac{\text{unit}}{\text{cubes}}$  Unit cubes are stacked to form a  $5 \times 5 \times 8$  box, which is painted blue. How many of the unit cubes have at least one face painted blue?
133. \_\_\_\_\_  $\frac{\text{years}}$  Maclay is three times as old as Pierce. Seven years ago, Maclay was four times as old as Pierce. How many years from now will Maclay be twice as old as Pierce?
134. \_\_\_\_\_  $\frac{\text{degrees}}$  Line AB is parallel to line CD, angle ABE measures 42 degrees, and angle CDE measures 37 degrees. A *reflex angle* is an angle whose degree measure is strictly between 180 and 360. What is the degree measure of the reflex angle BED?
- 
135. \_\_\_\_\_  $\frac{\text{mL}}$   A solution containing only water and alcohol has a volume of 120 mL, and 16 mL of the solution is water. What is the minimum amount of pure water that must be added to produce a solution that is at least 20 percent water by volume?
136. \_\_\_\_\_ A geometric sequence with 25 positive terms has first term  $\frac{1}{2^{32}}$  and last term  $2^{16}$ . What is the common ratio of this geometric sequence?
137. \$ \_\_\_\_\_ Together, Lakan and Sutton had \$20 when they entered the store and \$5 when they left. If Lakan spent half as much money in the store as Sutton spent, how much money did Sutton spend? 
138. \_\_\_\_\_ A regular polygon has  $n$  sides, and each interior angle has a degree measure no less than 150 and no greater than 160. What is the difference between the greatest and least possible values of  $n$ ?
139. \_\_\_\_\_  $\frac{\text{arrange-}}{\text{ments}}$  How many different arrangements of the letters in the word ALFALFA contain the word ALF at least once?
140. \_\_\_\_\_ Each of the numbers 128, 84 and 29 has a remainder  $m$  when divided by  $n$ . If  $m$  and  $n$  are positive integers, what is  $m + n$ ?



# Workout 1

141. \_\_\_\_\_ inches How many inches are in 22.5 yards?

142. \_\_\_\_\_ What is the greatest three-digit number whose digits have a sum of 22?

143. \_\_\_\_\_ flamingos



Jackie spotted 128 birds through her binoculars at Lake Kenya, of which 18.75% were flamingos. How many flamingos did Jackie spot?

144. \$ \_\_\_\_\_ The yearbook staff will order 285 yearbooks. Each yearbook costs \$14.73 to print. The 38 staff members will each receive a free yearbook. What is the least amount they can charge for each yearbook to have enough money to cover the printing costs?

145. \_\_\_\_\_ ordered pairs How many ordered pairs  $(a, b)$  of positive integers with  $a + b = 110$  satisfy  $ab \geq 2500$ ?

146. \_\_\_\_\_ Let  $r$  and  $s$  be real numbers for which  $\frac{r+s}{s} = \frac{5}{3}$ . What is the value of  $\frac{r^3 + s^3}{s^3}$ ? Express your answer as a common fraction.

147. \_\_\_\_\_ pieces The table shows how many pieces of cheese Timsy the Mouse eats each day of every week. If January 1 is a Monday, how many pieces of cheese will Timsy eat in the entire month of January?

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Pieces	3	2	1	1	1	7	1

148. \_\_\_\_\_ The arithmetic mean of four consecutive odd integers is 16. What is the least of the four integers?

149. \_\_\_\_\_ products Sapati is making a  $12 \times 12$  multiplication table of positive integers for his younger brother. How many of the products in the table will be even numbers?

x	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												

150. \_\_\_\_\_ pumpkins



At a barter's market, 3 pumpkins can be traded for 2 watermelons, and 3 watermelons can be traded for 5 cantaloupes. How many pumpkins are needed to trade for 100 cantaloupes?





# Workout 2

151. \_\_\_\_\_ What is the value of  $x + y$  if  $4x + 5y + z = 26$  and  $3x + 4y + z = 17$ ?

152. \$ \_\_\_\_\_ A sports team reduces the price of a player's jersey by 65% after the player is traded to another team. What is the reduced price of the player's jersey if it originally cost \$85?



153. \$ \_\_\_\_\_ A bag of chips costs \$1.96. Tamia buys the fewest bags necessary for the total cost to be a whole number of dollars. What is that whole number of dollars?



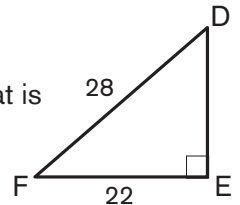
154. \_\_\_\_\_ What is the arithmetic mean of the 10 least prime numbers? Express your answer as a decimal to the nearest tenth.

155. \_\_\_\_\_ : \_\_\_\_\_ p.m. A fast clock gains 18 minutes every normal hour. The fast clock shows the correct time at 3:00 p.m. What is the correct time when the fast clock first displays the time 3:52 p.m.?



156. \_\_\_\_\_ miles A leatherback sea turtle needs  $\frac{1}{2}$  hour to swim a distance of  $5\frac{1}{2}$  miles. At this rate, how many miles could the turtle travel in 5 hours?

157. \_\_\_\_\_  $\text{cm}^2$  Right triangle DEF, shown here, has  $EF = 22$  cm and  $DF = 28$  cm. What is the area of triangle DEF? Express your answer in simplest radical form.



158. \_\_\_\_\_ Three distinct prime numbers have a sum of 16. What is their product?

159. \_\_\_\_\_ pages For her report "Odd Numbers Are Really Odd," Tselot numbered all the pages consecutively, beginning with 1. This required a total of 369 digits. How many pages are in her report?

160. \_\_\_\_\_ % A fun-sized package of jelly beans contains three red, four orange, two yellow, one green, five blue and seven pink jelly beans. What percentage of the jelly beans are red? Express your answer to the nearest whole percent.





# Workout 3

161. \_\_\_\_\_ What is the value of  $(6 + 8 + 10 + \dots + 38 + 40) - (5 + 7 + 9 + \dots + 37 + 39)$ ?

162. \_\_\_\_\_ days Daisy the duck lays an average of three eggs every five days. How many days will it take Daisy to lay four dozen eggs?



163. \$ \_\_\_\_\_ The Morgans ordered three salads, two hamburgers and five coffees. If a salad costs \$13.50, a hamburger costs \$8.75 and a coffee costs \$2.50, how much was the total cost of their order before tax?

164. \_\_\_\_\_ % The median value of a home in Hawaii in 1950 was \$12,283. In 2019, the median value of a home in Hawaii had increased to \$669,200. By what percent did the median value increase from 1950 to 2019? Express your answer to the nearest whole percent.

165. \_\_\_\_\_ ounces Lindsey weighs the items she is donating to the food bank. She brings three cans of corn, two jars of pickles and seven boxes of oatmeal. The average weight of all the items is 16.62 ounces. If the average weight of a can of corn is 15.25 ounces and the average weight of a jar of pickles is 24 ounces, what is the average weight of a box of oatmeal? Express your answer to the nearest tenth.

166. \_\_\_\_\_ What is the slope of the line perpendicular to a line parallel to the line  $3x + 4y = 6$ ? Express your answer as a common fraction.

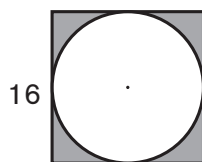
167. \_\_\_\_\_ combinations How many combinations of three prime numbers have a sum of 35?

168. \_\_\_\_\_ Six consecutive odd integers have a sum of 96. What is the least of the six integers?

169. \_\_\_\_\_ buttercups Cassidy's yard is filled with daisies and buttercups. The buttercups have five petals each, and the daisies have 34 petals each. There are three times as many buttercups as daisies. If Cassidy counts 1078 petals on the flowers in her yard, how many buttercups are there?



170. \_\_\_\_\_ in<sup>2</sup>



A circle is inscribed in a square of side length 16 inches. What is the total area of the shaded region in the square's interior and the circle's exterior? Express your answer to the nearest whole number.



# Workout 4

171. \_\_\_\_\_ What is the value of  $(2 - 1)^2 + (3 - 2)^2 + (4 - 3)^2 + \dots + (100 - 99)^2$ ?

172. \_\_\_\_\_ Which digit should replace K in the four-digit number 26K0 so that the number is divisible by both 6 and 4?

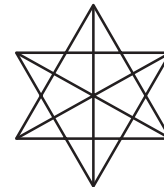
173. \_\_\_\_\_ balloons Balloons are used to decorate a party. If exactly 56% of the balloons at the party are not green, what is the least possible number of balloons that are not green?

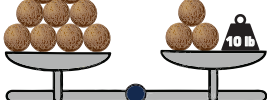


174. \$ \_\_\_\_\_ Sage purchased a sofa in California for \$1650 plus 7.5% sales tax. Nova bought the same sofa in Colorado for \$1650 plus 2.9% sales tax. What is the absolute difference in the amounts Sage and Nova paid?

175. \_\_\_\_\_ What is the value of  $|50 - 1| + |50 - 2| + \dots + |50 - 98| + |50 - 99|$ ?

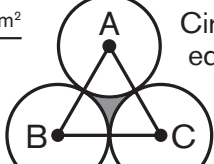
176. \_\_\_\_\_ triangles How many triangles of any size are in the figure shown?



177. \_\_\_\_\_ pounds  Nine coconuts are equal in weight to three coconuts plus a 10-pound weight. Assuming all the coconuts have the same weight, how much do the three coconuts weigh?

178. \_\_\_\_\_ bags Lila's cookie business has an order for  $12\frac{1}{2}$  dozen peanut butter blossoms, which each have a chocolate drop in the center. If chocolate drops come in bags containing 45 drops each, how many bags will Lila need to complete this order?



179. \_\_\_\_\_  $\text{cm}^2$   Circles A, B and C are constructed so that each circle intersects a side of equilateral triangle ABC at the midpoint of the side, as shown. If the perimeter of triangle ABC is 24 cm, what is the area of the shaded region in the interior of the triangle and the exterior of the circles? Express your answer as a decimal to the nearest tenth.

180. \_\_\_\_\_ The product of three consecutive multiples of 6 is 45,360. What is the least of the three numbers?



# Workout 5

181. \_\_\_\_\_ inches Given that 1 inch = 2.54 cm, 1 meter = 100 cm, and 1 km = 1000 meters, how many inches are in 1 kilometer? Express your answer to the nearest whole number.

182. \_\_\_\_\_ A path from  $P(1, 2)$  to  $R(3, 6)$ , consisting only of unit steps up or to the right, is chosen at random. What is the probability that the chosen path passes through a vertex (other than  $P$  and  $R$ ) of the rectangle containing all points  $(x, y)$  with  $1 \leq x \leq 3$  and  $2 \leq y \leq 6$ ? Express your answer as a common fraction.

183. \_\_\_\_\_ The product of six integers is 1, and their sum is  $S$ . What is the product of all possible values of  $S$ ?

184. \_\_\_\_\_ What is the absolute difference between the greatest common divisor and the least common multiple of 63 and 84?

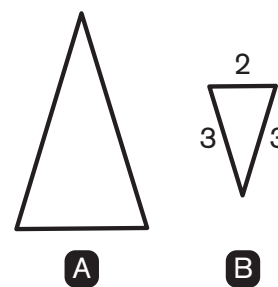
185. \_\_\_\_\_ % Sera bought a new camera for the discounted price of \$556.15. If the original price of the camera was \$1589.00, what percentage of the original price did Sera pay?



186. \_\_\_\_\_  $\text{cm}^2$  The area of a square is  $324 \text{ cm}^2$ . A rectangle has the same perimeter as the square. The width of the rectangle is half its length. What is the area of the rectangle?

187. \_\_\_\_\_ A list of four positive integers has range 100, mean 100, median 100 and mode 100. What is the greatest integer in this list?

188. \_\_\_\_\_ Triangles A and B are similar, and triangle B has sides of lengths 3, 3 and 2. If triangle A has a side of length 4, what is the sum of all possible perimeters of triangle A? Express your answer as a common fraction.



189. \_\_\_\_\_ orders The French Bakery sells three types of scones. How many different possible orders of a half dozen scones contain at least one of each type of scone?

190. \_\_\_\_\_ If  $N$  is a positive integer less than or equal to 100, and the decimal representation of  $\frac{1}{N}$  terminates, what is the sum of all possible values of  $N$ ?



# Workout 6

191. \_\_\_\_\_ The digits 2, 3, 4 and 5 can be used to form 24 different four-digit numbers containing four distinct digits. What is the arithmetic mean of these 24 numbers? Express your answer as a decimal to the nearest tenth.

192. \_\_\_\_\_ Taowe has written an interesting four-digit number. Each digit is a prime number. The hundreds digit is the sum of the units and the tens digit. The thousands digit is two more than the hundreds digit, and the units digit is greater than the tens digit. What number has Taowe written?

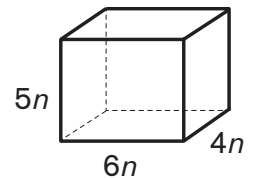
193. \_\_\_\_\_ Two standard dice are rolled. What is the probability that the sum of the two numbers rolled is not a prime number? Express your answer as a common fraction.



194. \_\_\_\_\_ Dion writes the positive integers from 1 through 15, inclusive, in a row, in ascending order. What is the smallest number that Dion can cross off so that the sum of the numbers to the left of the crossed-off number is at least the sum of the numbers to the right of the crossed-off number?

195. \_\_\_\_\_ <sup>past-</sup><sub>ries</sub> Gia makes three pastries in 12 minutes. Fia makes four of the same pastries in 9 minutes. If they work together for 288 minutes, how many pastries will they make?

196. \_\_\_\_\_ A right rectangular prism measures  $5n$  inches  $\times$   $6n$  inches  $\times$   $4n$  inches. The volume of the prism is  $3240 \text{ in}^3$ . What is the value of  $n$ ?



197. \_\_\_\_\_ If  $(5x - 7)^2 = ax^2 + bx + c$ , then what is  $a + b + c$ ?

198. \_\_\_\_\_ <sup>arrange-</sup><sub>ments</sub> Among the 24 arrangements of the letters in the word TEAM, how many have either the letters A, T and E in that order from left to right (not necessarily adjacent), or the letters T, E and A in that order from left to right (not necessarily adjacent)?

199. \_\_\_\_\_ A *palindrome* is a positive integer that does not end in 0 and reads the same forward and backward. What is the least three-digit positive integer that is neither a palindrome nor the sum of two palindromes?

200. \_\_\_\_\_ What is the sum of the positive integer factors of 2025?