



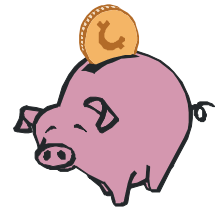
# Warm-Up 7

91. \_\_\_\_\_ people John's four brothers each have names that begin with the letter  $J$ , but none of the other members of his family has a name that begins with  $J$ . If a person in John's family is randomly selected, there is a 25% chance that the person's name will start with  $J$ . How many people are in John's family?

92. \_\_\_\_\_ The sum of two integers is 7, and the sum of their squares is 25. What is the product of these two integers?

93. \_\_\_\_\_ times When Roger hits the BAKE button on his oven, the temperature display shows  $+++$ . The first time he hits the TEMP button, the display changes to  $350^\circ$ . Each time Roger hits the TEMP button thereafter, the displayed temperature increases by  $5^\circ$ . After pressing the BAKE button, how many times does Roger need to hit the TEMP button to reach  $425^\circ$ ?

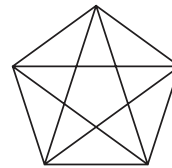
94. \_\_\_\_\_ quarters A piggy bank contains a certain number of coins, of which 53 are dimes and 19 are nickels. The remainder of the coins in the bank are quarters. If the probability of randomly selecting a quarter from the bank is  $\frac{1}{4}$ , how many quarters does the bank contain?



95. \_\_\_\_\_ units<sup>2</sup> What is the area, in terms of  $a$  and  $b$ , of a rectangle with a length and width of  $3a^2b$  units and  $2ab^3$  units, respectively?

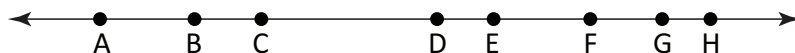
96. \_\_\_\_\_ cm The perimeter of an isosceles right triangle is 80 cm. What is the length of the hypotenuse? Express your answer in simplest radical form.

97. \_\_\_\_\_ triangles How many triangles of any size are contained in this figure?



98. \_\_\_\_\_ If  $a$ ,  $b$  and  $c$  are positive integers such that  $a + b = 9$  and  $ac - 2bc = 0$ , what is the value of  $a$ ?



99. \_\_\_\_\_ segment Points A through H are distributed along a line as shown. Seven segments are created with adjacent points as endpoints. On which of the seven segments should a new point X be placed so that the sum of the distances from point X to each point A through H is as small as possible?



100. \_\_\_\_\_ In a set with  $n$  elements, where  $n$  is a positive integer, what fraction of the subsets contain an even number of elements? Express your answer as a common fraction.



# Warm-Up 8

101. \_\_\_\_\_ There exist pairs of integers,  $x$  and  $n$ , for which  $x^n = (2^5)(4^4)(8^{\frac{8}{3}})(16^{\frac{3}{4}})$ . What is the greatest possible value of  $n$  among these pairs?
102. \_\_\_\_\_ If  $\frac{1}{x} + \frac{1}{y} = \frac{1}{2}$  and  $\frac{1}{x} - \frac{1}{y} = \frac{1}{4}$ , what is the value of  $\frac{1}{x^2} - \frac{1}{y^2}$ ? Express your answer as a common fraction.
103. \_\_\_\_\_ If  $n$  is a randomly chosen positive integer less than 2013, what is the probability that the sum  $1^n + 2^n + 3^n$  is divisible by 3? Express your answer as a common fraction.
104. \_\_\_\_\_ degrees In  $\triangle ABC$ ,  $AC = 12$  units and  $BC = 7$  units. If the area of  $\triangle ABC$  is 42 units<sup>2</sup>, what is the degree measure of  $\angle C$ ?
105. \_\_\_\_\_ ways Each face of a cube is colored either red or blue. In how many distinct ways can the cube be colored? Two colored cubes are distinct if one cannot be rotated to look like the other.
106. \_\_\_\_\_ A five-person committee has to meet at one of five possible times. Each member has a conflict at exactly one of the five times, and the conflicts are random and independent of each other. What is the probability that there is a time when all five people can meet? Express your answer as a common fraction.
- 
107. \_\_\_\_\_ Five distinct odd integers have a mean of 35 and a range of 22. What is the smallest possible value of the least of these five integers?
108. \_\_\_\_\_ papers  After deducting his 10% commission, Jun sent \$27 to the newspaper dealer for whom he delivers papers. If each newspaper sells for 20 cents, how many papers did Jun deliver?
109. \_\_\_\_\_ What is the value of  $r$  for which  $(r - 5)^2 = (r + 2)^2$ ? Express your answer as a decimal to the nearest tenth.
110. \$ \_\_\_\_\_ A popular brand of Brazilian coffee costs \$20 per pound, and a particular brand of Colombian coffee costs \$16 per pound. If you mix 15 pounds of Brazilian coffee with 5 pounds of Colombian coffee, how many dollars does one pound of the mixture cost?
- 