

1. The United States uses zip codes for all mail delivery addresses. These are of the form  $abcde-fghi$ , where  $a, b, c, d, e, f, g, h$  and  $i$  represent digits. How many zip codes are possible in which  $a$  is not 0? Express your answer in scientific notation.



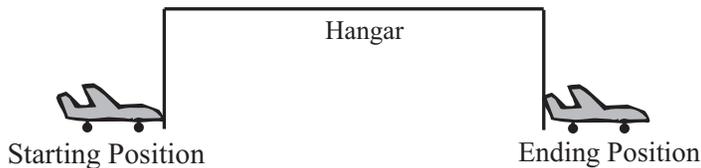
1. \_\_\_\_\_ zip codes

2. On a calculator Julian divided  $x$  into  $y$  and got the answer 1.0625, which is equivalent to  $1\frac{1}{16}$ . Both  $x$  and  $y$  were positive integers less than 50, but he can't remember what they were. What is the sum of all possible values of  $x$  and  $y$ ?

2. \_\_\_\_\_

3. At a particular speed, a jumbo jet can travel its own length in 20 seconds. At this same speed, the jumbo jet taxied completely past a 710-foot-long hangar in 70 seconds, as shown. What is the length of the jumbo jet?

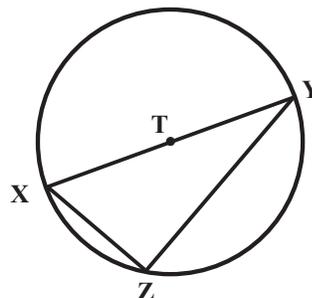
3. \_\_\_\_\_ feet



4. Cybil and Ronda are sisters. The 10 letters from their names are placed on identical cards so that each of 10 cards contains one letter. Without replacement, two cards are selected at random from the 10 cards. What is the probability that one letter is from each sister's name? Express your answer as a common fraction.

4. \_\_\_\_\_

5. Circle T has a circumference of  $12\pi$  inches, and segment XY is a diameter. If the measure of angle TXZ is  $60^\circ$ , what is the length, in inches, of segment XZ?

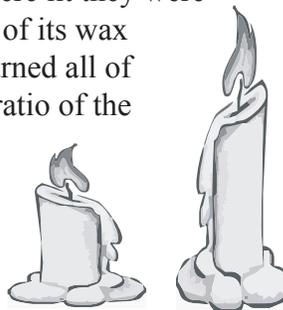


5. \_\_\_\_\_ inches

6. For how many positive integral values of  $a$  is it true that  $x = 2$  is the only positive integer solution of the system of inequalities
- $$\begin{cases} 2x > 3x - 3 \\ 3x - a > -6 \end{cases} ?$$

6. \_\_\_\_\_ values

7. One night two cylindrical wax candles of different heights and different diameters were lit. One of the candles was 20 cm taller than the other. They were both lit at the same time and each burned at a steady rate. Five hours after they were lit they were both the same height. The taller one burned all of its wax six hours after it was lit, and the shorter one burned all of its wax 10 hours after it was lit. What was the ratio of the original height of the shorter candle to the original height of the taller candle? Express your answer as a common fraction.



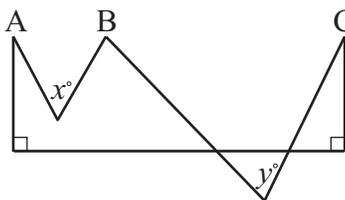
7. \_\_\_\_\_

8. Each of three, standard, six-sided dice is rolled once. What is the probability that the three numbers rolled are the lengths of the sides of an obtuse triangle? Express your answer as a common fraction.

8. \_\_\_\_\_



9. In the figure,  $m\angle A = 28^\circ$ ,  $m\angle B = 74^\circ$  and  $m\angle C = 26^\circ$ . If  $x$  and  $y$  are the measures of the angles in which they are shown, what is the value of  $x + y$ ?



9. \_\_\_\_\_ degrees

10. A circular tabletop is divided into four congruent sectors by two diameters that are perpendicular to each other. Each sector is to be painted with one of four colors. How many distinct ways can the table be painted? (A color may be used on more than one sector, but paintings that are the same after a rotation are not considered distinct.)



10. \_\_\_\_\_ ways