

All answers must be exact (i.e. they may contain  $\pi$ , radicals, fractions, terminating or repeating decimals, but they may NOT contain decimal approximations). Fractions must be expressed in lowest terms and radicals must be expressed in simplest radical form.

1. \_\_\_\_\_ A bag of 15 marbles contains 8 that are white and 7 that are black. If 5 marbles are picked out of the bag without looking what is the probability that all 5 marbles are black?
2. \_\_\_\_\_ The water for the football team is kept in a large round cooler. Currently the cooler is  $\frac{1}{3}$  full. If Steven pours 10 additional gallons of water into the cooler it will be  $\frac{3}{4}$  full. How many gallons of water does the cooler hold?
3. \_\_\_\_\_ An open box with a rectangular base is to be constructed out of a cardboard rectangle. The height of the box needs to be 2 inches and its volume must be 192 cubic inches. If the width of the cardboard rectangle is 4 inches less than its length, what are the dimensions of the cardboard rectangle?
4. \_\_\_\_\_ The product of two consecutive positive integers is 11 greater than their sum. What are the integers?
5. \_\_\_\_\_ A water tank has the shape of a right circular cone with an altitude of 18 feet and a base radius of  $9\sqrt{2}$  feet. If the water tank is oriented so that the circular base sits flush with the ground, how deep is the water in the tank if it currently contains  $936\pi$  cubic feet of water? (Hint: The volume of a right circular cone is given by  $V = \frac{1}{3}\pi r^2 h$ .)
6. \_\_\_\_\_ Together Juan, Miguel, and Jose have \$100. Miguel has two dollars less than three times the money Juan has. Jose has two dollars more than Juan. How much money do the three men have?
7. \_\_\_\_\_ The diagonal of a regular hexagon divides the hexagon into two quadrilaterals. If the length of the diagonal is 16 inches, how long is each side of the hexagon?
8. \_\_\_\_\_ A phone company charges its users a monthly fee of \$15.75 plus an additional fee for every minute talked. If John was charged \$37.35 by the phone company for the month of March and he talked on the phone for 360 minutes in March, how much does the company charge per minute?
9. \_\_\_\_\_ Three trains leave Central Station at 7:00am. It takes trains A, B, and C, 21 minutes, 30 minutes, and 35 minutes to reach their destinations respectively. If the three trains continuously make roundtrips from Central Station to their respective destinations, at what time will all three trains be at Central Station again?
10. \_\_\_\_\_ At a child's birthday party there are twice as many children as adults, twice as many male children as female children, and three times as many adult females as adult males. If there are 16 male children how many female adults are there?