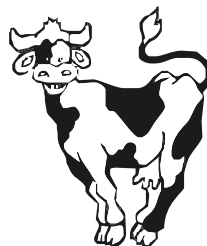


1. A rectangle has an area of  $400 \text{ cm}^2$ . If the rectangle is a square, what is its perimeter?

1. \_\_\_\_\_ centimeters

2. An octopus has 8 tentacles and 1 head. A jellyfish has 20 tentacles and no head. A cow has 4 legs and 1 head. Farmer Brown, who raises only octopi, jellyfish and cows on her farm, has animals with a total of 17 heads, 196 tentacles and 20 legs. How many animals does she have?

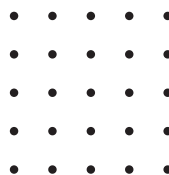


2. \_\_\_\_\_ animals

3. Louisa and Darya each rolled three balls toward lines that are 1, 2 and 3 meters away. A person's point total is determined by squaring the distance between each ball and the line it lands closest to and then adding the three squares together. The lowest score wins. Louisa's balls rolled 0.9, 2.2 and 2.7 meters, while Darya's rolled 1.2, 1.8 and 2.8 meters. By how many points did Darya win? Express your answer as a decimal to the nearest hundredth.

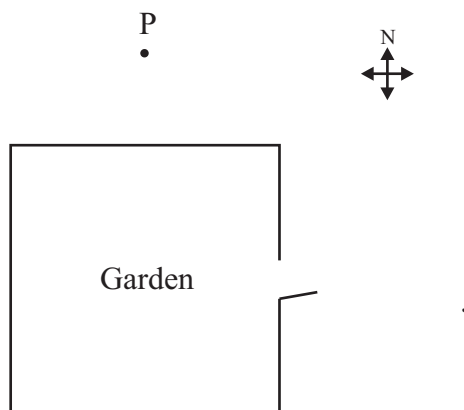
3. \_\_\_\_\_ points

4. How many non-congruent squares can be drawn, such that their vertices are lattice points on the 5 by 5 grid of lattice points shown?



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

5. A square garden has a gate at the center of the east wall. A pole (P) is located 50 feet outside the garden to the north, on a line that perpendicularly bisects north wall. Jeff (J) walks out through the center of the east gate, perpendicularly to the east wall, and he is first able to see the pole when he is exactly 98 feet from the east edge of the garden. What is the length of the north wall?



5. \_\_\_\_\_ feet

6. What is the smallest positive integer with exactly 14 positive divisors? 6. \_\_\_\_\_

7. A circle graph is to be constructed to represent all the people who participated in the 2006 Bridge Run & Walk. There will be 16 non-overlapping sectors in the circle graph representing the types of participants identified in the chart below. One such type is “male, adult runners who did not complete the race.” What is the sum of the measures of the central angles of the sectors representing adult runners who completed the race? Express your answer to the nearest whole number. 7. \_\_\_\_\_ degrees

**2006 Bridge Run & Walk**

Gender	Adult Runners	Non-adult Runners	Adult Walkers	Non-adult Walkers
Male	6700 (90%)*	300 (80%)*	3000 (95%)*	10,000 (85%)*
Female	4800 (92%)*	200 (90%)*	10,000 (96%)*	10,000 (80%)*

\*Total number of participants in category (percent of participants in category who completed the race)

8. A cylindrical glass is half full of lemonade. The ratio of lemon juice to water in the lemonade is 1:11. If the glass is 6 inches tall and has a diameter of 2 inches, what is the volume of lemon juice in the glass? Express your answer as a decimal to the nearest hundredth. 8. \_\_\_\_\_ cu inches

9. During football season, 25 teams are ranked by three reporters (Alice, Bob and Cecil). Each reporter assigned all 25 integers (1 through 25) when ranking the twenty-five teams. A team earns 25 points for each first-place ranking, 24 points for each second-place ranking, and so on, getting one point for a 25th place ranking. The Hedgehogs earned 27 total points from the three reporters. How many different ways could the three reporters have assigned their rankings for the Hedgehogs? One such way to be included is Alice - 14th place, Bob - 17th place and Cecil - 20th place. 9. \_\_\_\_\_ ways



10. The sides of unit square ABCD have trisection points X, Y, Z and W, as shown. If  $AX:XB = BY:YC = CZ:ZD = DW:WA = 2:1$ , what is the area of the shaded region? Express your answer as a common fraction. 10. \_\_\_\_\_

