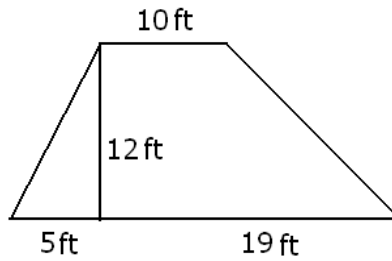
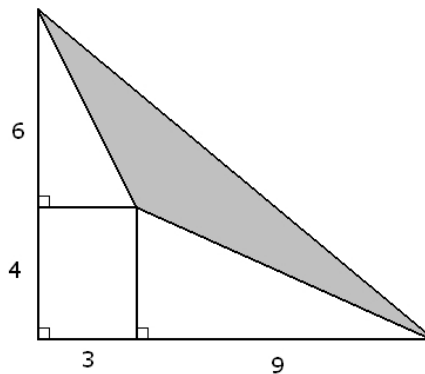


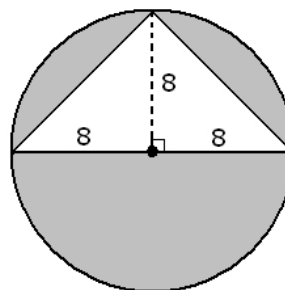
1. Let $U = \{1, 2, \dots, 80\}$, $A = \{\text{numbers divisible by } 7\}$, $B = \{\text{numbers divisible by } 5\}$, and $C = \{\text{numbers less than } 40\}$. (A , B , and C are subsets of U .)
 - a) Find $A \cap B$.
 - b) Find $A \cap \overline{B}$.
 - c) How many proper subsets does $A \cap C$ have?
2. We asked 100 students about their transportation to school. 65 uses public transportation, and 72 drives. 55 uses both of these occasionally. How many students drive to school and not use public transportation?
3. Does the triangle with sides 7 in, 24 in, and 25 in have a right angle?
4. Two sides of a right triangle are 20 cm and 29 cm. Find the third side.
5. We roll two dice. What is the probability that
 - a) The two numbers rolled are the same.
 - b) The first number rolled is smaller than the second number rolled.
 - c) The sum of the two numbers rolled is 10.
 - d) The product of the two numbers rolled is 6.
 - e) The sum of the two numbers rolled is odd.
 - f) The product of the two numbers rolled is odd.
 - g) None of the numbers rolled is 4.
6. We toss six coins. Compute the probability that the outcome is
 - a) all six are tails
 - b) five tails and one heads
 - c) four tails and two heads.
 - d) three tails and three heads.
7. We randomly pull 2 cards from $\{1, 2, \dots, 10\}$, without replacement. Find each of the following probabilities
 - a) We pull the number 7 twice
 - b) None of the numbers pulled is a 7
 - c) One of the numbers pulled is 7.
 - d) The sum of the two numbers pulled is 11.
 - e) The sum of the two numbers pulled is 8.
8. Compute $\binom{11}{3} + \binom{11}{6} - \binom{11}{9} - \binom{11}{10}$
9. Find the distance between the points $A(5, -2)$ and $B(10, 10)$.
10. The population of a town has increased from 80000 to 87200. What percent of a change does this represent?
11. We borrow \$2000 for a year, with a simple annual interest rate of 6%. After 5 months, we make a partial payment of \$700. After an additional 9 months (that is, 14 months after the start), we make another partial payment of \$800. How much do we have to pay back at the end of the two years?
12. Consider the trapezoid shown on the picture.
 - a) Find the perimeter of the trapezoid. Include units in your computation and answer.
 - b) Find the area of the trapezoid. Include units in your computation and answer.
 - c) The trapezoid is the base of a solid with height 4 ft. Find the volume of the solid.
 - d) The trapezoid is the base of a pyramid with height 4 ft. Find the volume of the pyramid.



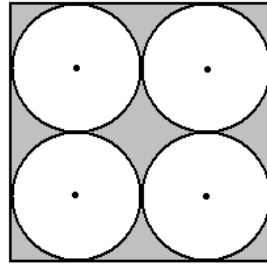
13. Consider a circle with radius 12 m.
- Compute the circumference of the circle. Include units in your computation and answer.
 - Compute the area of the circle. Include units in your computation and answer.
 - The circle is the base of cylinder with height 15 m. Find the volume of the cylinder. Include units in your computation and answer.
 - The circle is the base of cone with height 15 m. Find the volume of the cone. Include units in your computation and answer.
14. Consider the right triangle shown below.
- Find the area of the shaded region in the right triangle.
 - Find the longest side in the triangle.



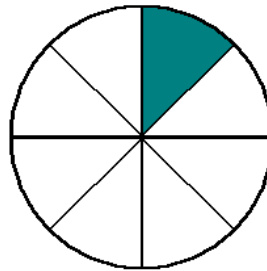
15. Find the area of the shaded region in the circle.



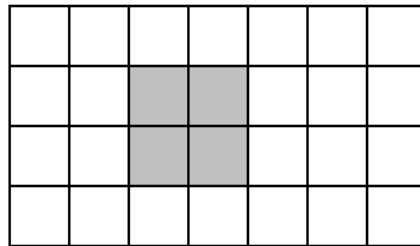
16. Find the area of the shaded region if the square has sides 12 m long.



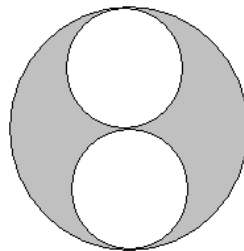
17. The circle shown on the picture below is of radius 10 cm.



- a) Find the length of the arc belonging to the darkened sector.
 - b) Find the area of the darkened sector.
18. We randomly drop a small object on the figure shown below. Assume it lands on the figure. What is the probability that it will land on the darkened region?



19. Consider the circles shown on the picture below. The smaller circles have radius 5 m.



- a) Compute the area of the shaded region.
 - b) We randomly drop a small object on the figure. Assume it lands within the larger circle. What is the probability that it will land on the darkened region?
20. Consider a bank account with a compound annual interest rate of 7%, compounded monthly. How much money do we need to deposit into this account so that there is \$1000 in the account five years later?