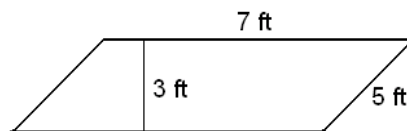


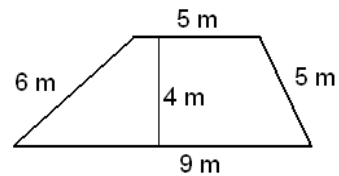
## Review Problems

- There are 100 points on a circle. Find the number of different
  - line segments these points determine.
  - triangles these points determine.
  - 5-sided polygons these points determine.
- How many licence plates are possible if a plate consists of two letters (out of 26) and a four-digit number (can not start with zero) if
  - repetition of letters and digits is allowed.
  - repetition of letters and digits is not allowed.
- The complement of an angle is 5 times the angle. Find the angle.
- We placed \$1000 in a bank account with an annual simple interest rate of 7%, compounded annually. How much money do we have in the bank after fifty years if the bank offers
  - simple interest
  - compound interest
- We borrowed \$3500, for three years, with a simple annual interest rate of 9%. Seven months after the borrowing date, we make a partial payment of \$1000. After an additional year, we make another partial payment of \$800. How much do we have to pay back at the end of the three years?
- The number of particles has increased by 150%. If there is now 3 750 000 particles, how many were there before?
- We pull three cards out of  $\{1, 2, 3, \dots, 10\}$ , without replacement.
  - How many outcomes are possible if we also account for the order of the numbers pulled (i.e. 1, 7, 5 and 5, 1, 7 would count as two different outcomes).
  - Out of these, in how many outcomes do we pull the numbers in an increasing order?
  - How many outcomes are possible if we ignore the order of the numbers pulled (i.e. 1, 7, 5 and 5, 1, 7 would count as the same outcome).
- A coin is tossed nine times. How many outcomes are there
  - with 6 heads?
  - with at most 6 heads?
  - with at least 2 heads?
  - with an even number of heads?
- A small town's lottery is designed to select four numbers out of 35. How many different ways can we fill out a lottery ticket?
- How many five-digit numbers are there with the property that none of its digits is 7?
  - How many even five-digit numbers are there with the property that none of its digits is 7?
- We asked 220 students about the TV shows they watch. Among these students, 130 watch The Daily Show with Jon Stewart, 128 watch The Colbert Report and 140 watch BBC News. 93 watch both The Daily Show and The Colbert Report, 82 watch both The Daily Show and BBC News, and 81 watch both The Colbert Report and BBC News. 67 watch all three shows.
  - How many students watch neither of these shows?
  - How many students watch only The Daily Show?
  - How many students watch exactly two of these shows?

12. How many different seven-digit phone numbers are possible, if the first digit can not be zero?
13. An inner angle of a regular polygon measures  $162^\circ$ . How many sides does the polygon have?
14. Find the perimeter and area of a rectangle with sides 12 m and 28 m long. Include units in your computation and answer.
15. Find the perimeter and area of a right triangle with sides 20 ft, 21 ft, and 29 ft long. Include units in your computation and answer.
16. a) Find the perimeter and area of the parallelogram shown on the picture below. Include units in your computation and answer.
- b) Find the perimeter and area of the trapezoid shown on the picture below. Include units in your computation and answer.

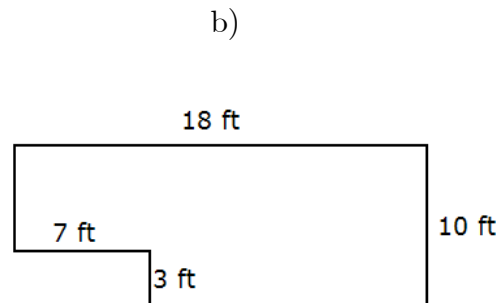
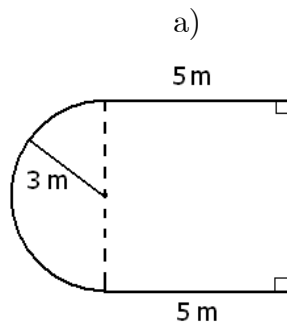


(a)



(b)

17. Find the circumference and area of a circle with radius 4 ft. Include units in your computation and answer.
18. Find the area and perimeter of the figures shown below. Include units in your computation and answer.



## Review Problems - Answers

$$1. \text{ a) } \binom{100}{2} = 4950 \quad \text{b) } \binom{100}{3} = 161\,700 \quad \text{c) } \binom{100}{5} = 75\,287\,520$$

$$2. \text{ a) } 26^2 \cdot 9 \cdot 10^3 = 6084\,000 \quad \text{b) } 26 \cdot 25 \cdot 9 \cdot 9 \cdot 8 \cdot 7 = 2948\,400$$

$$3. 15^\circ$$

$$4. \text{ a) } 1000(1 + 0.07(50)) = 4500 \quad \text{b) } 1000(1.07)^{50} = \$29\,457.03$$

$$5. \$2396.26$$

$$6. 1\,500\,000$$

$$7. \text{ a) } 10 \cdot 9 \cdot 8 = 720 \quad \text{b) } 120 \quad \text{c) } \binom{10}{3} = 120$$

$$8. \text{ a) } \binom{9}{6} = \binom{9}{3} = 84 \quad \text{b) } 2^9 - \left( \binom{9}{7} + \binom{9}{8} + \binom{9}{9} \right) = 466$$

$$\text{c) } 2^9 - \left( \binom{9}{0} + \binom{9}{1} \right) = 502 \quad \text{d) } \binom{9}{0} + \binom{9}{2} + \binom{9}{4} + \binom{9}{6} + \binom{9}{8} = 256$$

$$9. \binom{35}{4} = 52\,360$$

$$10. \text{ a) } 8 \cdot 9^4 = 52\,488 \quad \text{b) } 8 \cdot 9 \cdot 9 \cdot 9 \cdot 5 = 29\,160$$

$$11. \text{ a) } 11 \quad \text{b) } 22 \quad \text{c) } 55$$

$$12. 9 \cdot 10^6 = 9\,000\,000$$

$$13. 20$$

$$14. P = 80 \text{ m} \quad A = 336 \text{ m}^2$$

$$15. P = 70 \text{ ft} \quad A = 210 \text{ ft}^2$$

$$16. \text{ a) } P = 24 \text{ ft} \quad A = 21 \text{ ft}^2 \quad \text{b) } P = 25 \text{ m} \quad A = 28 \text{ m}^2$$

$$17. C = 8\pi \text{ ft} \approx 25.1327 \text{ ft} \quad A = 16\pi \text{ ft}^2 \approx 50.2655 \text{ ft}^2$$

$$18. \text{ a) } P = (16 + 3\pi) \text{ m} \approx 25.424778 \text{ m} \quad A = \left( 30 + \frac{9\pi}{2} \right) \text{ m}^2 \approx 44.137167 \text{ m}^2$$

$$\text{b) } P = 56 \text{ ft} \quad A = 159 \text{ ft}^2$$