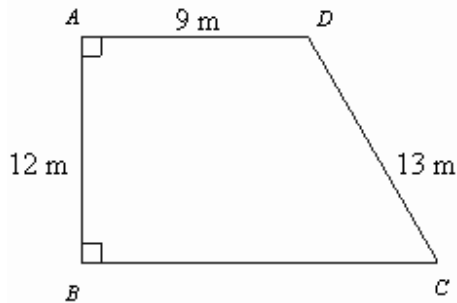
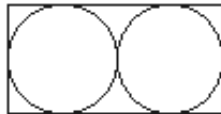


UBC Grade 5-8 Problems 1998

1. Find the area of figure $ABCD$ in m^2 .

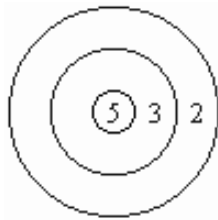


2. Two equal circles are placed in a rectangle as shown. The distance between the centres of the circles is 8 cm . Find the area of the rectangle.



3. A litre of orange drink contains 10% orange juice. How much orange juice (in mL) must be added so that the resulting mixture contains 40% orange juice?
4. At a family reunion of 12 people, the official photographer takes pictures of two people at a time. If each person has his or her picture taken with every other person, what is the smallest number of pictures that can be taken?

5. A dart board consists of three circles as shown. The inner circle is worth 5 points, the middle ring is worth 3 points, and the outer ring is worth 2 points. Find the smallest number of darts that can be thrown to earn a score of exactly 21.



6. If June contains five Sundays in a particular year, then on what days may June 11 occur?
7. Suppose it takes nine hours to fill $\frac{3}{5}$ of a swimming pool. At this rate, how many hours will it take to fill the remainder of the pool?
8. Into how many pieces can a 12" pizza be cut so that the slices are at least as big as those obtained when an 9" pizza is cut into eighths?
9. In a series of three games to be played between two equally matched teams (Vancouver Canucks and Edmonton Oilers), the first team to win two games will win the series. Suppose Vancouver wins the first game. What is the probability that Vancouver will win the series?
10. What is the largest amount of money in coins which one can have without being able to make change for a ten dollar bill? for a five dollar bill?
11. A billiard ball is rolled from the corner of a $6\text{ ft} \times 10\text{ ft}$ billiard table and it continually rolls off each wall at an angle of 45 degrees. Does the ball eventually land at a corner pocket? If it does, how far does the ball travel?
12. Suppose Chris cycled from home to school at a constant speed of 20 km/h and returned home using the same route at a constant speed of 30 km/h. What was Chris' average speed for the whole trip? What would be the average speed if Chris took a longer route home at a constant speed of 30 km/h?

13. A rectangular floor (5 m by 7 m) is to be tiled by square tiles (10 cm by 10 cm). The tiles can only be bought in boxes of 30 tiles to a box. What is the smallest number of boxes one must buy in order to tile the whole floor?
14. Among grandfather's papers, the following bill was found:

27 cherry tomato plants \$.5**

The first and last digits were so smudged as to be illegible. What are the possible prices of one cherry tomato plant?

15. One American gallon is about 3.8 litres. The exchange rate is \$1.00 US = \$1.40 Cdn. In Blaine, Washington, a gallon of gas costs \$1.30 US. In Vancouver a litre of gas costs 60 cents (Cdn). How much money can you save (in Canadian dollars) when you buy a tankful of gas (10 gallons) in Blaine instead of Vancouver?
16. Five dice (six-sided, numbered 1-6) are rolled and their top faces are examined. Find the probability that the product of the faces is even.
17. UBC doughnuts are sold only in boxes of 7 or 13. To buy 14 doughnuts you must order two boxes of 7, but you cannot buy exactly 15 doughnuts since no combination of boxes contains 15 doughnuts. What is the largest number of doughnuts that cannot be ordered using combinations of these boxes?