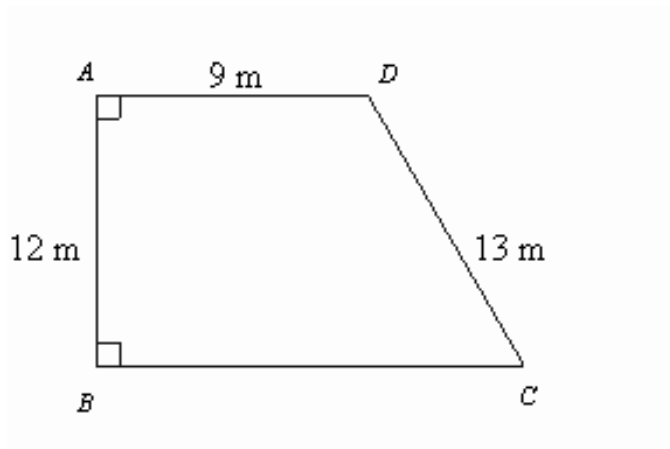
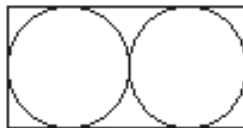


UBC Grade 5-8 Problems 1995

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

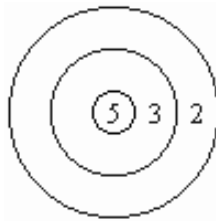


2. Two equal circles are placed in a rectangle as shown. The distance between the centres of the circles is 8 cm . Find the area of the rectangle.



3. 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?

4. The words TALMUD TORAH are to be centred in a space allowing 50 letters. No spaces are permitted between the letters and there is one space between the two words. Find the number of spaces a typist must leave before starting to type the words.
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. In five games, Kirky Hirshy has allowed in an average of four goals per game. When his worst game is removed, his average improves to two goals per game. How many goals were scored on Kirky Hirshy in his worst game?
9. Suppose Ariel cycled from home to Talmud Torah 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 Ariel's average speed for the whole trip? Would the answer be different if Ariel took a longer route home?
10. 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 20 tiles to a box. What is the smallest number of boxes one must buy in order to tile the whole floor?
11. Find all whole numbers (integers) n so that $n^2 - n + 2$ is a prime number. Demonstrate that you have found all such numbers.

12. One American gallon is about 3.8L. The exchange rate is $\$1 \text{ US} = \1.40 Cdn . In Blaine, Washington, a gallon of gas costs $\$1.10 \text{ US}$. In Vancouver, a litre of gas costs 60 Canadian cents. How much money can you save (in Canadian dollars) when you buy a full tank of gas (10 gallons) in Blaine instead of Vancouver?
13. *Talmud Torah* doughnuts are sold only in boxes of 7, 13 or 25. To buy 14 doughnuts, you must order two boxes of 7, but you can not 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?