

## CLOCK HAND PROBLEMS

NEW HAMPSHIRE STATE TEAM  
NATIONAL MATHCOUNTS PREPARATION

The problems on this sheet all make use of a standard analog clock with digits 1–12 with a short hour hand and a longer minute hand (and an even longer second hand when necessary).

- (1) What is the angle between the hour and minute hands at 1:23 pm?
  
- (2) What is the first time in the afternoon that the hour and minute hands form a 45 degree angle?
  
- (3) What is the first time after 4:25pm that the minute and hour hands meet? What about the second and hour hands? Second and minute?
  
- (4) How many minutes pass between 5pm and the next time the clock hands form a 150 degree angle?
  
- (5) If the longer hand is 2 in. and the shorter hand is 1in. what is the absolute value of the difference in distances traveled by the tip of the minute hand and the tip of the hour hand in 5 hours?
  
- (6) What is the probability that at a randomly chosen time in the 3:00 hour the angle between the hour and minute hands is acute?
  
- (7) How many times during the day do any two of the 3 clock hands form a right angle? Are there any times when the three hands form two right angles and one straight angle? If so, how many times does this occur per day?
  
- (8) If our standard clock is changed so that the minute and hour hands the same length how many times during the day are we unable to tell what time it is based on the position of the hands?