
MATHCOUNTS®

2011

■ Chapter Competition ■
Team Round
Problems 1–10

School _____
Team
Members _____, Captain

**DO NOT BEGIN UNTIL YOU ARE
INSTRUCTED TO DO SO.**

This section of the competition consists of 10 problems which the team has 20 minutes to complete. Team members may work together in any way to solve the problems. Team members may talk to each other during this section of the competition. This round assumes the use of calculators, and calculations also may be done on scratch paper, but no other aids are allowed. All answers must be complete, legible and simplified to lowest terms. The team captain must record the team's official answers on his/her own competition booklet, which is the only booklet that will be scored. If the team completes the problems before time is called, use the remaining time to check your answers.

Total Correct	Scorer's Initials

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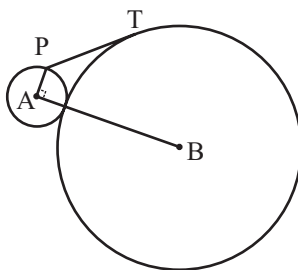
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7. Circles A and B are externally tangent. Angle PAB is a right angle. Segment PT is tangent to circle B at T. If the radius of circle A is 1 cm and the radius of circle B is 7 cm, what is the length of segment PT?



7. _____ cm

8. When 3-digit area codes were first used, the first digit could not be a 0 or a 1, and the second digit could *only* be a 0 or a 1. There were no restrictions on the third digit. In 1995 the restrictions on the second digit were lifted. How many more 3-digit area codes are possible today than were possible prior to 1995?

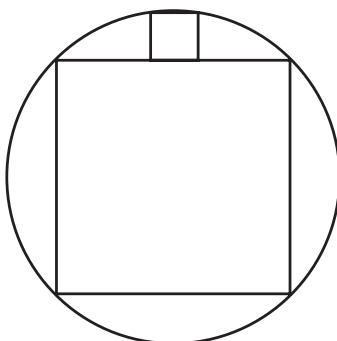


8. _____ area codes

9. Suppose each of the nine digits $\{1, 2, 3, \dots, 9\}$ is used exactly once as a digit in either the four-digit positive integer a or the five-digit positive integer b . What is the smallest possible value of a if $\frac{a}{b} = \frac{1}{2}$?

9. _____

10. A square is inscribed in a circle. A smaller square has one side coinciding with a side of the larger square and has two vertices on the circle, as shown. What percent of the area of the larger square is the area of the smaller square?



10. _____ %

