

TMC – 2006 – MATH BOWL

| Round 7 | Questions | Answers |
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| 1. | In how many ways can a set of 3 students ordered by age be chosen from a group of 9 students all of varying ages? | 504 |
| 2. | Consider 6 individuals positioned 1 to 6 in a circle such that each third individual going around the circle is removed from the group until only one individual remains. For example, the individual in position three is removed first. Find the position in which you should stand in order to be the last one remaining. | First Position |
| 3. | What is the remainder when 391 is divided by 9? | 4 |
| 4. | What is the remainder when $x^3 - 1$ is divided by $x^2 + x + 1$? | 0 |
| 5. | A hat contains 4 blue marbles and 6 red marbles. If 2 marbles are drawn simultaneously from the hat, what is the probability that both of the marbles are blue? | $\frac{2}{15}$ or 2:15 |
| 6. | A number that is not the root of <i>any</i> polynomial with integer coefficients is a _____ number. | transcendental |
| 7. | If I bicycle up a hill at 20 miles per hour for 30 minutes and then down a hill at 40 miles per hour for 15 minutes, then how far I traveled? | 20 or 20 miles |
| 8. | What is the value of e raised to the natural logarithm of 7? | 7 |
| 9. | Adding 8π to the circumference of a circle adds how much to the diameter of the circle? | 8 |
| 10. | If one of the base angles of an isosceles triangle is 49 degrees then how many degrees is the vertex angle? | 82 |

Tie Breakers

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| 1. | What is the slope of a horizontal line? | zero |
| 2. | What is the largest prime factor of the difference 5 factorial minus 3 factorial? | 19 |