State High School Mathematics Tournament

University of South Carolina

Tiebreaker – February 1, 2024

Tiebreaker Rules

Tiebreaker Rules

- You will be asked one question whose answer is a positive integer, and you will have 90 seconds to answer.

Tiebreaker Rules

- You will be asked one question whose answer is a positive integer, and you will have 90 seconds to answer.
- **Solving it exactly within 90 seconds is probably impossible.**

Tiebreaker Rules

- You will be asked one question whose answer is a positive integer, and you will have 90 seconds to answer.
- **Solving it exactly within 90 seconds is probably impossible.**
- Try to solve it **approximately**, as accurately as you can, and make an educated guess.

Tiebreaker Rules

- You will be asked one question whose answer is a positive integer, and you will have 90 seconds to answer.
- **Solving it exactly within 90 seconds is probably impossible.**
- Try to solve it **approximately**, as accurately as you can, and make an educated guess.
- The answer(s) **closest to the truth** (in either direction) win the tiebreaker.

Tiebreaker Question

Watch the *Price Is Right* clip, and *take notes!*

Tiebreaker Question

Given that

Tiebreaker Question

Given that

- The digits in the price are 1, 2, 5, 6, 7, and 8 in some order;

Tiebreaker Question

Given that

- The digits in the price are 1, 2, 5, 6, 7, and 8 in some order;
- The third digit is not 7;

Tiebreaker Question

Given that

- The digits in the price are 1, 2, 5, 6, 7, and 8 in some order;
- The third digit is not 7;
- The first digit is not 1;

Tiebreaker Question

Given that

- The digits in the price are 1, 2, 5, 6, 7, and 8 in some order;
- The third digit is not 7;
- The first digit is not 1;
- The second digit is not 6;

Tiebreaker Question

Given that

- The digits in the price are 1, 2, 5, 6, 7, and 8 in some order;
- The third digit is not 7;
- The first digit is not 1;
- The second digit is not 6;
- The first digit is not 8;

Tiebreaker Question

Given that

- The digits in the price are 1, 2, 5, 6, 7, and 8 in some order;
- The third digit is not 7;
- The first digit is not 1;
- The second digit is not 6;
- The first digit is not 8;
- The first digit is not 6;

Tiebreaker Question

Given that

- The digits in the price are 1, 2, 5, 6, 7, and 8 in some order;
- The third digit is not 7;
- The first digit is not 1;
- The second digit is not 6;
- The first digit is not 8;
- The first digit is not 6;
- The second digit is not 7;

Tiebreaker Question

Given that

- The digits in the price are 1, 2, 5, 6, 7, and 8 in some order;
- The third digit is not 7;
- The first digit is not 1;
- The second digit is not 6;
- The first digit is not 8;
- The first digit is not 6;
- The second digit is not 7;
- The sixth digit is not 8;

Tiebreaker Question

Given that

- The digits in the price are 1, 2, 5, 6, 7, and 8 in some order;
- The third digit is not 7;
- The first digit is not 1;
- The second digit is not 6;
- The first digit is not 8;
- The first digit is not 6;
- The second digit is not 7;
- The sixth digit is not 8;

How many possibilities are there for the price of the car?

Tiebreaker Answer

Answer. 170.

Tiebreaker 2

How many integers $n \leq 202020$ can be written in the form

$$n = a^3 + b^3 + c^3,$$

where a, b, c are positive integers?

Tiebreaker 2 Answer

Answer. 21581.