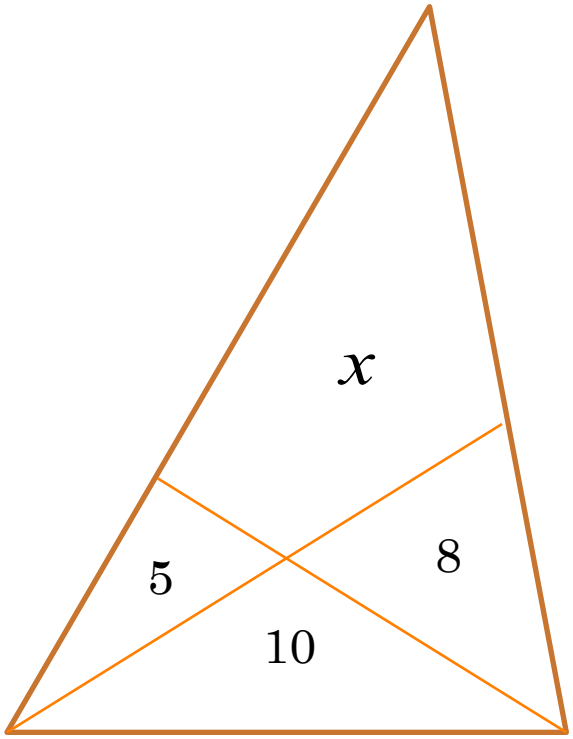
The Puzzle Vault

1. Four areas

1. Four areas



2. Digit sums

2. Digit sums

- Take any positive whole number n.

2. Digit sums

- Take any positive whole number n.
- Prove there exists a multiple of n whose digit sum is odd.

3.The Superfrog

3.The Superfrog

- Starts at zero.

3.The Superfrog

- Starts at zero.
- Every second the frog jumps n to the right.

3.The Superfrog

- Starts at zero.
- Every second the frog jumps n to the right.
- After one second we decide we want to catch him.

3.The Superfrog

- Starts at zero.
- Every second the frog jumps n to the right.
- After one second we decide we want to catch him.
- Every second (starting from 1 second) we check a number.

3.The Superfrog

- Starts at zero.
- Every second the frog jumps n to the right.
- After one second we decide we want to catch him.
- Every second (starting from 1 second) we check a number.
- We don't know what n is.

3.The Superfrog

- Starts at zero.
- Every second the frog jumps n to the right.
- After one second we decide we want to catch him.
- Every second (starting from 1 second) we check a number.
- We don't know what n is.
- Find a strategy that guarantees capture.

3.The Superfrog

- Starts at zero.
- Every second the frog jumps n to the right.
- After one second we decide we want to catch him.
- Every second (starting from 1 second) we check a number.
- We don't know what n is.
- Find a strategy that guarantees capture.
- What if the frog picks the direction?

3.The Superfrog

- Starts at zero.
- Every second the frog jumps n to the right.
- After one second we decide we want to catch him.
- Every second (starting from 1 second) we check a number.
- We don't know what n is.
- Find a strategy that guarantees capture.
- What if the frog picks the direction?
- What if the frog picks the starting number?

4.Odd factors

4.Odd factors

- 4

4.Odd factors

- 4
- (5)
- (6)
- (7)
- (8)

4.Odd factors

- 4
- (5)　5
- (6)　3
- (7)　7
- (8)　1

4.Odd factors

- 4
- (5) 5
- (6) 3
- (7) 7
- (8) 1

$$16 = 4^2$$

4.Odd factors

4.Odd factors

- Let n be a positive whole number, and consider the largest odd factors of n+1, n+2, n+3, …, 2n.

4.Odd factors

- Let n be a positive whole number, and consider the largest odd factors of n+1, n+2, n+3, …, 2n.
- Prove that their sum is n^2.

Links

Links

- puzzlecritic.wordpress.com
- @puzzlecritic

Links

- puzzlecritic.wordpress.com
- @puzzlecritic

- danielthepianist@gmail.com

Links

- puzzlecritic.wordpress.com
- @puzzlecritic

- danielthepianist@gmail.com

- THANK YOU!