Methods of proof II

- **วิชชาภัทร จินดานาถ** previously submitted answers to this quiz/test on 21-Oct-2023 @ 11:48:35 and obtained **6** correct answers out of **6** .
- This test/quiz can be taken many times.
- Correct answers will NOT be revealed after submission.

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1 Consider the following statement:
"If 3n+2 is even, then n is even for all integers n."
To prove the statement above, which of the following is **the best method**?

From previous attempt

Contradiction Proof

Contraposition Proof

Both contradiction and contraposition can be used

None of the above

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2 Consider the following statement:

"At least 3 of any 25 days chosen must fall in the same month of the year."

From previous attempt

By using **CONTRADICTION** proof, which of the following is **the best assumption** for the first step of the proof?

Assume that "At least 3 of any 25 days chosen must fall on the same month of the year" is true.

Assume that "At most 3 of any 25 days chosen must fall on the same month of the year" is true.

Assume that "There are more than 3 of any 25 days chosen that fall on the same month of the year" is true.

Assume that "There are less than 3 of any 25 days chosen that fall on the same month of the year" is true.

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3 If n is an integer, find the smallest positive integer k such that $2n^2 + n + k$ is not divisible by 3.

From previous attempt

0

1

2

3

4

10. Consider the following statement:

"If n is an integer, then $n^2 - 5n + 7$ is an odd integer"

From previous attempt

To prove the statement above by **proof by cases**

1. case 1: n is even
   case 2: n is odd
2. case 1: $n > 0$
   case 2: $n < 0$
3. case 1: $n = 2k + 1$ for some integer k
   case 2: $n = 2k$ for some integer k
4. case 1: $n = 4k + 1$ for some integer k
   case 2: $n = 4k + 2$ for some integer k
   case 3: $n = 4k + 3$ for some integer k

Which choices can be used as a case?

1 or 2

1 or 3

1 or 4

3 or 4

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5 Find the smallest positive integer n that serves as a counterexample to the statement that $n^2 + n - 17$ is not divisible by 17.

From previous attempt

14

15

16

17

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6 Which of the following best describes the statement

"There exists a triple (a, b, c) of positive integers such that $a^2 + b^2 = c^2$"
and the attempt to prove it by choosing a = 3, b = 4, c = 5

From previous attempt

The choice of a = 3, b = 4, c = 5 correctly proves the statement.

The choice of a = 3, b = 4, c = 5 is not a valid solution to the statement.

The statement cannot be proven using any values of a, b, c

None of the above

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Previous (?q=onlinecourse/theatre/27034/Ur3qzKAHWeeJyc)

Next (?q=onlinecourse/theatre/27035/fQZzM2TZsBliN)