Question: 1. Consider the statement, "For all natural numbers n, if n is prim···

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Discrete Math:

1. Consider the statement, "For all natural numbers n, if n is prime, then n is solitary." You do not need to know what *solitary* means for this problem, just that it is a property that some numbers have and others do not.
   (a) Write the converse and the contrapositive of the statement, saying which is which. Note: the original statement claims that an implication is true for all n, and it is that implication that we are taking the converse and contrapositive of.
   (b) Write the negation of the original statement. What would you need to show to prove that the statement is false?
   (c) Even though you don't know whether 10 is solitary (in fact, nobody knows this), is the statement "if 10 is prime, then 10 is solitary" true or false? Explain.
   (d) It turns out that 8 is solitary. Does this tell you anything about the truth or falsity of the original statement, its converse or its contrapositive? Explain.
   (e) Assuming that the original statement is true, what can you say about the relationship between the *set* P of prime numbers and the *set* S of solitary numbers. Explain.

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Expert Answer

Anonymous answered this
558 answers

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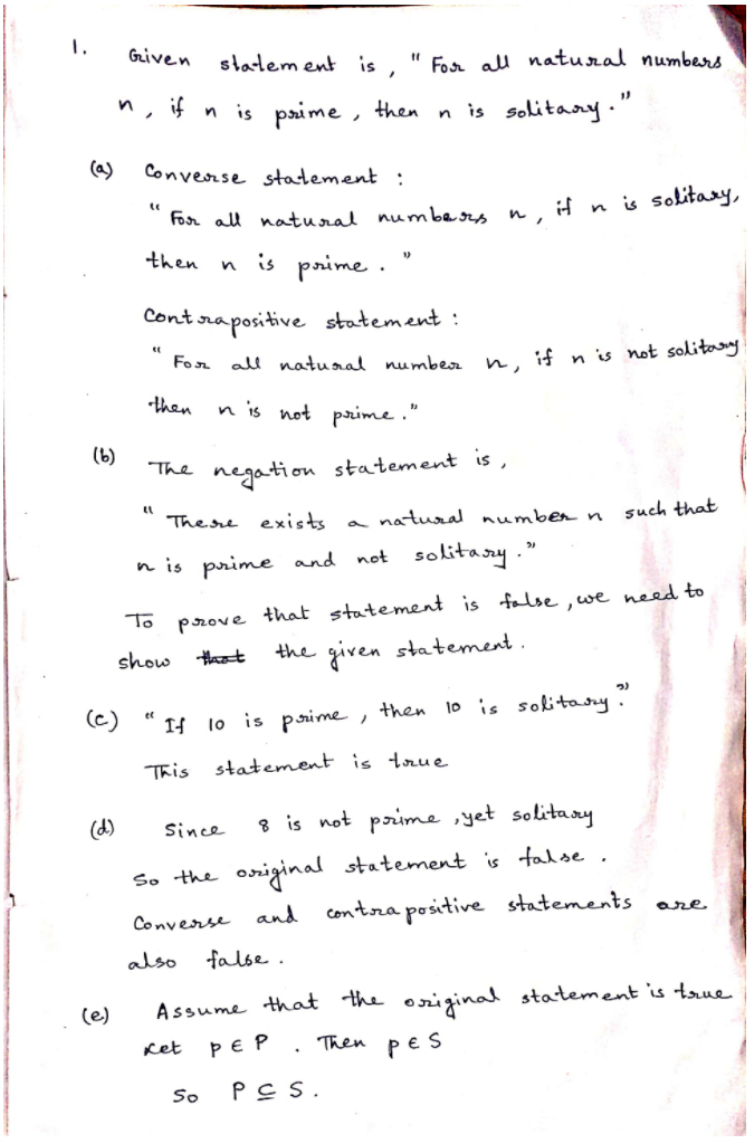

1. Given statement is, "For all natural numbers n, if n is prime, then n is solitary."

(a) Converse statement:
"For all natural numbers n, if n is solitary, then n is prime."

Contrapositive statement:
"For all natural number n, if n is not solitary then n is not prime."

(b) The negation statement is,
"There exists a natural number n such that n is prime and not solitary."

To prove that statement is false, we need to show ~~that~~ the given statement.

(c) "If 10 is prime, then 10 is solitary."
This statement is true

(d) Since 8 is not prime, yet solitary
So the original statement is false.
Converse and contrapositive statements are also false.

(e) Assume that the original statement is true
Let $p \in P$. Then $p \in S$
So $P \subseteq S$.

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Q: 3. (25 points) Consider the statement, "For all natural numbers n, if n is prime, then n is solitary." You do not need to know what solitary means for this problem, just that it is a property that some numbers have and others do not a. Write the converse and the contrapositive of the statement, saying which is which. Note: the original statement claims that an implication is true...

A: See answer

Q: Discrete Math: I specifically need help with 1.B) and 1.D). Thank you!

A: See answer

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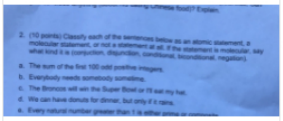
Up next for you in Advanced Math

Consider the statement, "For all natural numbers n,n, if nn is prime, then nn is solitary." You do not need to know what solitary means for this problem, just that it is a property that some numbers have and others do not.

See answer

- vousy Chinese food)? Explain. 2. (10 points) Classify each of the sentences below as an atomic statement, a ...



See answer

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Q: 3. (25 points) Consider the statement, "For all natural numbers n, if n is prime, then n is solitary." You do not need to know what solitary means for this problem, just that it is a property that some numbers have and others do not a. Write the converse and the contrapositive of the statement, saying which is which. Note: the original statement claims that an implication is true...

A: See answer

Q: 1. Let $A = \{2,4,6,8\}$. Suppose B is a set with $|B| = 5$. a) What are the smallest and largest possible values of $|A \cup B|$? Explain your answer. b) What are the smallest and largest possible values of $|A \cap B|$? Explain your answer. c) What are the smallest and largest possible values of $|A \times B|$? Explain your answer. 2. Draw the Venn diagrams for the following. No credit...

A: See answer 100% (3 ratings)

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