a.

Let P (x) mean "x is an excellent automobile" and Q (x) mean "x is inexpensive." The implication of "No good vehicles are cheap" is that "For all automobiles x, if x is a nice car, then x is not cheap."

When written in symbolic form:

∀x, if P(x), then ~Q(x)

P (Rimbaud)

:. ~Q (Rimbaud)

Let's consider Rimbaud a, then the argument becomes

∀x, if P(x), then ~Q(x)

~Q (a)

: .P (a)

This argument is an example of the converse mistake. The conclusion is false because the converse mistake is an improper reference rule. As a result, the reasoning is flawed.

b.

Assume that P (x) stands for "x is a nice automobile" and Q(x) stands for "x is inexpensive." Accordingly, the statement "No good vehicles are cheap" means that "For all automobiles x, if x is a nice car, then x is not cheap."

This can be written in the symbolic statement as:

∀x, if P(x), then ~Q(x)

~Q (Simbaru)

:. P (Simbaru)

Let Simbaru be considered as a. Then, the argument becomes

∀x, if P(x), then ~Q(x)

~Q (a)

: .P (a)

This argument is an example of the converse mistake. The conclusion is false because the converse mistake is an improper reference rule. As a result, the reasoning is invalid.

2.

Rewriting the premises using if-then form:

1. If a bird is at least 9 feet tall, then it is Ostrich
2. If a bird is in this aviary, then it belongs to me
3. If a bird is on mince pies, then it is not an Ostrich
4. If a bird belongs to me, it is at least 9 feet high.

Contrapositive form of 3rd statement:

If a bird is an Ostrich, then it does not live on mince pies

Rearranged premises would be:

b. If a bird is in this aviary, then it belongs to me

d. If a bird belongs to me, it is at least 9 feet high

a. If a bird is at least 9 feet high, then it is an ostrich

c. If a bird is an ostrich, then it does not live on mince pies

When c and b are put together:

No bird in this aviary lives on mince pies

Hence, these are the rearranged premises.

1. a.   
    The number 6m+8n can be written as 2(3m+4n)

By the definition n is an even integer if n=2k

Since it can be written as 2(3m+4n) which is in the form n=2k, hence by the above definition, it is even

b.

The number 10mn+7 can be written as (10m+8)-1= 2(5m+4)-1

By the definition n is an odd if such that n=2k+1

Since it can be written as 2(5m+4)-1, it is odd.

c.

The given statement is not true for all m>n>0

For example: if m>n>0. We take m=4 n=3, then m^2-n^2 is 16-9 which is 7. Therefore, the number m^2-n^2 is a prime number.

a>> n is any odd integer

b>> 2r + (2r+1)

c>> m + n is odd

Theorem: For every integer k, if k > 0 then 𝑘 +2𝑘+ 1 is composite.  
"Proof: Suppose k is any integer such that k > 0. If 𝑘2 +2𝑘+ 1 is composite, then   
𝑘2 +2𝑘+ 1 = 𝑟𝑠 for some integers r and s such that   
1 < 𝑟< 𝑘2 + 2𝑘+ 1  
and   
1 < 𝑠< 𝑘2 + 2𝑘+ 1  
since, 𝑘2 + 2𝑘+ 1 = 𝑟𝑠  
and both r and s are strictly between 1 and 𝑘 +2𝑘+ 1, then 𝑘2 +2𝑘+ 1 is not prime.   
Hence 𝑘2 +2𝑘+ 1 is composite as was to be shown."