

Math 55 Quiz 1  
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Name: \_\_\_\_\_

1. True or False? No justification needed.
  - (a)  $\forall xP(x) \wedge \forall xQ(x)$  and  $\forall x(P(x) \wedge Q(x))$  are logically equivalent.
  - (b)  $\exists xP(x) \wedge \exists xQ(x)$  and  $\exists x(P(x) \wedge Q(x))$  are logically equivalent.
  
2. Show that  $(p \rightarrow r) \vee (q \rightarrow r)$  and  $(p \wedge q) \rightarrow r$  are logically equivalent without using a truth table.
  
  
  
  
  
  
  
  
  
  
3. Determine the truth value of each of the following statements. The domain is the set of all integers.
  - (a)  $\forall n \exists m (n^2 < m)$ .
  - (b)  $\exists m \forall n (n^2 < m)$ .
  - (c)  $\exists n \forall m (n < m^2)$ .
  - (d)  $\forall m \exists n (n < m^2)$ .