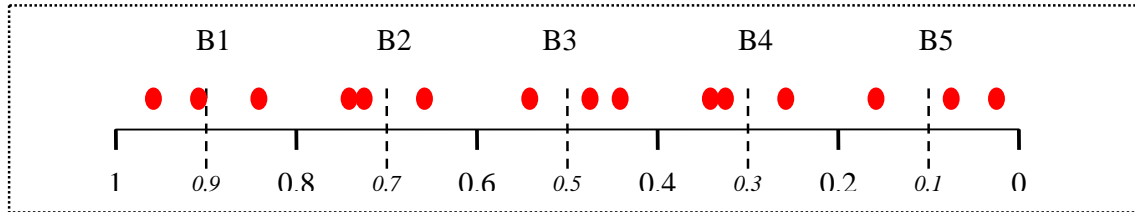


## Testing the Understandability Model

### Distribution of test proof trees (based on their predicted FIs):



### Materials: Test Questions

#### B1.1 (r1&r3, FI = $1 * 0.96 = 0.96$ ):

1. EquivalentClasses(C0,C1)
  2. ObjectPropertyDomain(r0,C0)
- > ObjectPropertyDomain(r0,C1)

#### Question:

Assume that the following statements are true:

- (a) A siggen is defined as a conkeff.
- (b) Anything that has a supernatural ability is a siggen.

We are interested in whether it follows that *anything that has a supernatural ability is a conkeff*. A person tried to justify this conclusion as follows:

- "From statement (a) we infer that (c) every siggen is a conkeff.  
From statements (b) and (c) we infer that anything that has a supernatural ability is a conkeff."

- Is this reasoning correct? (required)

- ☐ Yes  
☐ No

- How difficult did you find this question? (required)

- ☐ Very easy  
☐ Easy  
☐ Average  
☐ Difficult  
☐ Very difficult

#### B1.2 (r4&r5, FI = $0.96 * 0.94 = 0.90$ ):

- 1.SubClassOf(ObjectUnionOf(C0,C1),C2)
  - 2.SubClassOf(C0,C3)
- SubClassOf(C0,ObjectIntersectionOf(C2,C3))

### Question:

Assume that the following statements are true:

- (a) Everything that is a churbit or a rigfap is a napsate.
- (b) Every churbit is a bootler.

We are interested in whether it follows that *every churbit is both a napsate and a bootler*. A person tried to justify this conclusion as follows:

"From statement (a) we infer that (c) every churbit is a napsate.  
From statements (c) and (b) we infer that every churbit is both a napsate and a bootler."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult

**B1.3 (r2&r8, FI = 0.96\*0.90 = 0.86):**

- 1.SubClassOf(C0,ObjectIntersectionOf(C1,C2))
- 2.ObjectPropertyRange(r0,C0)
- ObjectPropertyRange(r0,C1)

### Question:

Assume that the following statements are true:

- (a) Every reatloid is both a foutray and a moku.
- (b) Anything that something simitates is a reatloid.

We are interested in whether it follows that *anything that something simitates is a foutray*. A person tried to justify this conclusion as follows:

"From statement (a) we infer that (c) every reatloid is a foutray.  
From statements (b) and (c) we infer that anything that something simitates is a foutray."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult

**B2.1 (r18&r3, FI = 0.77\*0.96 = 0.74):**

- 1.ObjectPropertyRange(r0,C1)
- 2.SymmetricObjectProperty(r0)
- 3.SubClassOf(C1,C0)
- > ObjectPropertyDomain(r0,C0)

### Question:

Assume that the following statements are true:

- (a) Anything that something contates is a percum.
- (b) "X contates Y" means the same as "Y contates X".
- (c) Every percum is a bluestine.

We are interested in whether it follows that *anything that contates something is a bluestine*. A person tried to justify this conclusion as follows:

"From statements (a) and (b) we infer that (d) anything that contates something is a percum.  
From statements (d) and (c) we infer that anything that contates something is a bluestine."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

**B2.2 (r12&r8, FI = 0.80\*0.90 = 0.72):**

- 1.SubClassOf(C0,C1)
- 2.SubClassOf(C1,C2)
- 3.ObjectPropertyRange(r0,C0)
- > ObjectPropertyRange(r0,C2)

### Question:

Assume that the following statements are true:

- (a) Every banity is a forsive.
- (b) Every forsive is a dodina.
- (c) Anything that something outgribes is a banity.

We are interested in whether it follows that *anything that something outgribes is a dodina*. A person tried to justify this conclusion as follows:

"From statements (a) and (b) we infer that (d) every banity is a dodina.  
From statements (c) and (d) we infer that anything that something outgribes is a dodina."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☒ Very difficult

**B2.3 (r10&r12, FI = 0.82\*0.80 = 0.66):**

1.EquivalentClasses(C1,ObjectUnionOf(C2,C3))

2.SubClassOf(C0,C2)

--> SubClassOf(C0,C1)

**Question:**

Assume that the following statements are true:

(a) A wilmon is anything that is a blacknic or a ractor.

(b) Every broader is a blacknic.

We are interested in whether it follows that *every broader is a wilmon*. A person tried to justify this conclusion as follows:

"From statement (a) we infer that (c) every blacknic is a wilmon.

From statements (b) and (c) we infer that every broader is a wilmon."

- Is this reasoning correct? (required)

☐ Yes

☐ No

- How difficult did you find this question? (required)

☐ Very easy

☐ Easy

☐ Average

☐ Difficult

**B3.1 (r25&r24, FI = 0.72\*0.73 = 0.53):**

1.SubClassOf(ObjectComplementOf(C1),C2)

2.SubClassOf(C1,C0)

3.SubClassOf(C2,C0)

--> SubClassOf(Thing,C0)

### Question:

Assume that the following statements are true:

- (a) Everything that is not an uffish is a mimsy.
- (b) Every uffish is a formixt.
- (c) Every mimsy is a formixt.

We are interested in whether it follows that *everything is a formixt*. A person tried to justify this conclusion as follows:

"From statement (a) we infer that (d) everything is an uffish or a mimsy.  
From statements (d), (b) and (c) we infer that everything is a formixt."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

### B3.2 (r14&r33, FI = 0.79\*0.61 = 0.48):

- 1.SubObjectPropertyOf(r0,r1)
- 2.SubObjectPropertyOf(r1,r2)
- 3.ObjectPropertyDomain(r2,C0)
- > ObjectPropertyDomain(r0,C0)

### Question:

Assume that the following statements are true:

- (a) If X wabes Y then X outgribes Y.
- (b) If X outgribes Y then X hurrifies Y.
- (c) Anything that hurrifies something is a pawdle.

We are interested in whether it follows that *anything that wabes something is a pawdle*. A person tried to justify this conclusion as follows:

"From statements (a) and (b) we infer that (d) if X wabes Y then X hurrifies Y.  
From statements (c) and (d) we infer that anything that wabes something is a pawdle."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

**B3.3 (r37&r11, FI = 0.55\*0.82 = 0.45):**

- 1.SubClassOf(C0,ObjectMinCardinality(1,r1,C2))
  - 2.SubObjectPropertyOf(r1,r0)
  - 3.SubClassOf(ObjectSomeValuesFrom(r0,C2),C1)
- > SubClassOf(C0,C1)

**Question:**

Assume that the following statements are true:

- (a) Every poondle brilligs at least one jartner.
- (b) If X brilligs Y then X gyres Y.
- (c) Everything that gyres a jartner is a launter.

We are interested in whether it follows that *every poondle is a launter*. A person tried to justify this conclusion as follows:

- "From statements (a) and (b) we infer that (d) every poondle gyres at least one jartner.  
From statements (d) and (c) we infer that every poondle is a launter."

- Is this reasoning correct? (required)

- ☒ Yes  
☐ No

- How difficult did you find this question? (required)

- ☐ Very easy  
☐ Easy  
☐ Average  
☐ Difficult  
☐ Very difficult

**B4.1 (r44&r9, FI = 0.40\*0.86 = 0.34):**

- 1.ObjectPropertyRange(r0,C1)
  - 2.InverseObjectProperties(r1,r0)
  - 3.SubClassOf(C0,ObjectSomeValuesFrom(r1,C2))
- > SubClassOf(C0,C1)



## Question:

Assume that the following statements are true:

- (a) Anything that something gimbles is a todest.
- (b) "X gimbles Y" means the same as "Y is gimbled by X".
- (c) Every heper is gimbled by a labit.

We are interested in whether it follows that *every heper is a todest*. A person tried to justify this conclusion as follows:

"From statements (a) and (b) we infer that (d) anything that is gimbled by something is a todest.  
From statements (c) and (d) we infer that every heper is a todest."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

## B4.2 (r30&r40, FI = 0.64\*0.50 = 0.32):

- 1.SubClassOf(C0,ObjectSomeValuesFrom(r0,C2))
  - 2.ObjectPropertyRange(r0,C1)
  - 3.DisjointClasses(C1,C2)
- > SubClassOf(C0,Nothing)

Assume that the following statements are true:

- (a) Every melect toves a foild.
- (b) Anything that something toves is a zotel.
- (c) No foild is a zotel.

We are interested in whether it follows that *there are no melects*. A person tried to justify this conclusion as follows:

"From statements (a) and (b) we infer that (d) every melect toves something that is both a foild and a zotel.  
From statements (d) and (c) we infer that there are no melects."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

**B4.3 (r48&r12, FI = 0.32\*0.80 = 0.26):**

- 1.SubClassOf(C2,ObjectAllValuesFrom(r0,C1))
  - 2.InverseObjectProperties(r0,r1)
  - 3.SubClassOf(C0,ObjectSomeValuesFrom(r1,C2))
- > SubClassOf(C0,C1)

**Question:**

Assume that the following statements are true:

- (a) Every raggle simitates only tansels.
- (b) "X simitates Y" means the same as "Y is simitated by X".
- (c) Every napid is simitated by a raggle.

We are interested in whether it follows that *every napid is a tansel*. A person tried to justify this conclusion as follows:

"From statements (a) and (b) we infer that (d) everything that is simitated by a raggle is a tansel.  
From statements (c) and (d) we infer that every napid is a tansel."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

**B5.1 (r45&r42, FI = 0.40\*0.45 = 0.18):**

- 1.FunctionalDataProperty(d0)
  - 2.SubClassOf(C0,DataHasValue(d0,I0^DT0))
  - 3.SubClassOf(C0,DataHasValue(d0,I1^DT0)) where I1 # I0
  - 4.SubClassOf(C1,ObjectMinCardinality(2,r0,C0))
- > SubClassOf(C1,Nothing)



Assume that the following statements are true:

- (a) Everything has as tenemy at most one value.
- (b) Every eckest has as tenemy an integer value of 7.
- (c) Every eckest has as tenemy an integer value of 13.
- (d) Every pomino gafres at least two eckests.

We are interested in whether it follows that *there are no pominoes*. A person tried to justify this conclusion as follows:

"From statements (a), (b) and (c) we infer that (e) there are no eckests.  
From statements (d) and (e) we infer that there are no pominoes."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

**B5.2 (r49&r42, FI = 0.19\*0.45 = 0.09):**

- 1.SubClassOf(C1,ObjectSomeValuesFrom(r0,DataHasValue(d0,"l0"^^xsd:string)))
  - 2.DataPropertyRange(d0,DT0)
  - 3.SubClassOf(C0,ObjectSomeValuesFrom(r1,C1))
- > SubClassOf(C0,Nothing)

Assume that the following statements are true:

- (a) Every disnuck glistes something that has as travity a decimal value of 7.9.
- (b) Any value that something has as travity is an integer.
- (c) Decimal values are not integer values.
- (d) Every rhelliest stoizes a disnuck.

We are interested in whether it follows that *there are no rhelliests*. A person tried to justify this conclusion as follows:

"From statements (a), (b) and (c) we infer that (e) there are no disnucks.  
From statements (d) and (e) we infer that there are no rhelliests."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

**B5.3 (r51&r17, FI = 0.04\*0.78 = 0.03):**

- 1.EquivalentClasses(C0,ObjectAllValuesFrom(r0,C1))

2.ObjectPropertyDomain(r0,C0)

--> SubClassOf(Thing,C0)

### Question:

Assume that the following statements are true:

- (a) A suffment is anything that estiles only momes.
- (b) Anything that estiles something is a suffment.

We are interested in whether it follows that *everything is a suffment*. A person tried to justify this conclusion as follows:

"From statement (a) we infer that (c) everything that estiles nothing at all is a suffment.  
From statements (b) and (c) we infer that everything is a suffment."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

## Materials: Control Questions

**T1: (a trivial question, the correct answer is "Yes")**

Assume that the following statements are true:

- (a) A wolide is defined as a lofam.
- (b) Batfink is a wolide.

We are interested in whether it follows that *Batfink is a lofam*. A person tried to justify this conclusion as follows:

"From statement (a) we infer that (c) every wolide is a lofam.  
From statements (b) and (c) we infer that Batfink is a lofam."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

**T2: (a trivial question, the correct answer is “Yes”)**

Assume that the following statements are true:

- (a) Bartok is an efrist of Rasputin.
- (b) Rasputin is a foucle.
- (c) Every foucle is a pagbo.

We are interested in whether it follows that *Bartok is an efrist of a pagbo*. A person tried to justify this conclusion as follows:

"From statements (a) and (b) we infer that (d) Bartok is an efrist of a foucle.  
From (d) and (c) we infer that Bartok is an efrist of a pagbo."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

### T3: (a trivial question, the correct answer is “Yes”)

Assume that the following statements are true:

- (a) Every zosta is both a toublem and a slekro.
- (b) Jasconius is a zosta.

We are interested in whether it follows that *Jasconius is a toublem*. A person tried to justify this conclusion as follows:

"From statement (a) we infer that (c) every zosta is a toublem.  
From (b) and (c) we infer that Jasconius is a toublem."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

### T4: (a trivial question, the correct answer is “Yes”)

Assume that the following statements are true:

- (a) Snavely is a tefo.
- (b) Snavely is an edug.
- (c) Snavely is a placle.

We are interested in whether it follows that *Snavely is a tefo, an edug and a placle*. A person tried to justify this conclusion as follows:

"From statements (a) and (b) we infer that (d) Snavely is both a tefo and an edug.  
From (d) and (c) we infer that Snavely is a tefo, an edug and a placle."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

**T5: (a trivial question, the correct answer is “Yes”)**

Assume that the following statements are true:

- (a) Banner has as efrist a string value of “red”.
- (b) Banner has as efrist a string value of “green”.
- (c) Banner has as efrist a string value of “blue”.

We are interested in whether it follows that *Banner has as efrist at least three string values*. A person tried to justify this conclusion as follows:

"From statements (a) and (b) we infer that (d) Banner has as efrist at least two string values.  
From (d) and (c) we infer that Banner has as efrist at least three string values."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

**NE1: (a non-entailment question, the correct answer is “No”)**

Assume that the following statements are true:

- (a) Every plizzle is both an uslous and a foucle.
- (b) Every uslous is an eblutin.
- (c) No eblutin is a foucle.

We are interested in whether it follows that *there are no bandersnatches*. A person tried to justify this conclusion as follows:

"From statements (a) and (b) we infer that (d) every plizzle is both an eblutin and a foucle.  
From (d) and (c) we infer that there are no bandersnatches."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

**NE2: (a non-entailment question, the correct answer is “No”)**

Assume that the following statements are true:

- (a) Every pawdle has as mome a string value of “green”.
- (b) Anything that has as mome some value is a borogove.
- (c) Every pawdle is a bandersnatch.
- (d) No borogove is a bandersnatch.

We are interested in whether it follows that *there are no pawdles*. A person tried to justify this conclusion as follows:

"From statements (a) and (b) we infer that (e) every oblun is a grefoum.  
From statements (e), (c) and (d) we infer that there are no pawdles."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

**NE3: (a non-entailment question, the correct answer is “No”)**

Assume that the following statements are true:

- (a) A dricho is defined as a ploupal.
- (b) Everything that is not a dricho is a ploupal.

We are interested in whether it follows that *everything is a borogove*. A person tried to justify this conclusion as follows:

"From statement (a) we infer that (c) every dricho is a ploupal.  
From statements (c) and (b) we infer that everything is a borogove."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult



**NE4: (a non-entailment question, the correct answer is “No”)**

Assume that the following statements are true:

- (a) Anything that something is a sadar of is an ethim.
- (b) If X is an uchis of Y then X is a sadar of Y.
- (c) Every ethim is a kredo.

We are interested in whether it follows that *anything that something is an uchis of is a kredo*. A person tried to justify this conclusion as follows:

"From statements (a) and (b) we infer that (d) anything that something is an uchis of is a kroutatin.  
From (d) and (c) we infer that anything that something is an uchis of is a kredo."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

**NE5: (a non-entailment question, the correct answer is “No”)**

Assume that the following statements are true:

- (a) Every stikra is both a thipre and a fizon.
- (b) Every stikra is something that is not a thipre.

We are interested in whether it follows that *there are no prouglazes*. A person tried to justify this conclusion as follows:

"From statement (a) we infer that (c) every stikra is a thipre.  
From statements (c) and (b) we infer that there are no prouglazes."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

**NE6: (a non-entailment question, the correct answer is “No”)**

Assume that the following statements are true:

- (a) Every protin thisles something that thisles an uktrat.
- (b) If X thisles Y and Y thisles Z then X thisles Z.
- (c) If X thisles Y then X stoizes Y.

We are interested in whether it follows that *every protin stoizes an uktrat*. A person tried to justify this conclusion as follows:

"From statements (a) and (b) we infer that (d) every borogove thisles a blamipal.  
From (d) and (c) we infer that every protin stoizes an uktrat."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

**NE7: (a non-entailment question, the correct answer is “No”)**

Assume that the following statements are true:

- (a) Every doutin glites at least one blemin.
- (b) Anything that glites at least one thing is a frukle.
- (c) No doutin is a frukle.

We are interested in whether it follows that *there are no kriglodars*. A person tried to justify this conclusion as follows:

"From statements (a) and (b) we infer that (d) every doutin is a frukle.  
From (d) and (c) we infer that there are no kriglodars."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

**NE8: (a non-entailment question, the correct answer is “No”)**

Assume that the following statements are true:

- (a) Every igrus estiles at least four sapals.
- (b) Every igrus estiles at most two things.
- (c) Every drenig toves an igrus.

We are interested in whether it follows that *there are no drenigs*. A person tried to justify this conclusion as follows:

"From statements (a) and (b) we infer that (d) there are no zoclatins.  
From (c) and (d) we infer that there are no drenigs."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

**NE9: (a non-entailment question, the correct answer is “No”)**

Assume that the following statements are true:

- (a) Every kluba is an adrich.
- (b) Every kluba is a blemin.
- (c) Everything that is both an adrich and a blemin is a chapal.

We are interested in whether it follows that *every prugram is a grefoum*. A person tried to justify this conclusion as follows:

"From statements (a) and (b) we infer that (d) every kluba is both an adrich and a blemin.  
From (d) and (c) we infer that every prugram is a grefoum."

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult

**NE10: (a non-entailment question, the correct answer is “No”)**

Assume that the following statements are true:

- (a) If X gafres Y and Y gafres Z then X gafres Z.
- (b) “X gafres Y” means the same as “Y is gafred by X”.
- (c) Every nekro is gafred by something that is gafred by an ugrich.

We are interested in whether it follows that *every nekro is gafred by an ugrich*. A person tried to justify this conclusion as follows:

“From statements (a) and (b) we infer that (d) if X is a doutin of Y and Y is a doutin of Z then X is a doutin of Z.

From (c) and (d) we infer that every nekro is gafred by an ugrich.”

- Is this reasoning correct? (required)

- ☐ Yes
- ☐ No

- How difficult did you find this question? (required)

- ☐ Very easy
- ☐ Easy
- ☐ Average
- ☐ Difficult
- ☐ Very difficult