

tc core 122: Quiz 7

Key

[9] (Wks 7 & §7.1) TRUE/FALSE: For each of the following determine if the statement is true or false and provide some *justification* for your answer.

1. Two perpendicular geodesics on a sphere cross only once.

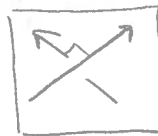
started reason (+.5) False
 reasoning (+1)
 sense (+.5)
 something that's true (+.5)
 clarity (+.5)



2. Two perpendicular geodesics on patty paper cross only once.

True

Geometry on a plane will let 2 lines \perp to each other go on forever in dif. directions & only meet once



3. The measure of angles in a triangle on a sphere can sum to 270° .

True

example:



FREE RESPONSE.

1. [2] (5/18 Lecture) Spherical geometry challenged the axioms that Euclid set out in 300BC. Kurt Gödel was a mathematician who challenged another set of axioms. What axioms did Gödel upset in the 1930's?

started (+.5)
 ball part (+.5)
 got it (+1)

Aristotle's axioms of logic

in particular: the 3rd axiom of the excluded middle principle (that all statements are either true or false)

2. [2] In Chapter 7 Lang takes two preexisting origami designs and adds texture to them. Name them.

skated/in book (+.5)
at least 1 (+.5) Koi (+.5) & turtle (+.5)

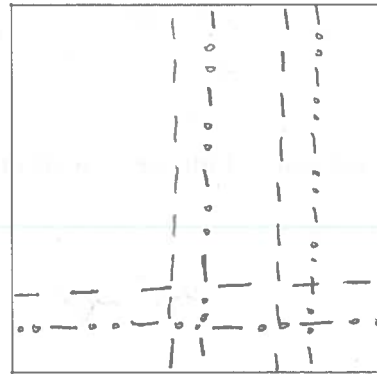
3. [2] Name one of the reasons that Lang decided not to use the basic crossed pleat when designing the Koi?

skated (+.5)
true/in book (+.5)
got it (+1)

1) He didn't like the shape < vs [

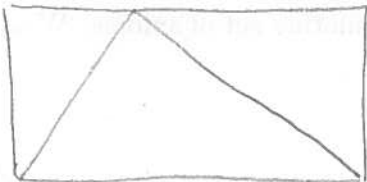
2) efficiency - the basic crossed pleat wasted a lot of paper by having thick layers.
- the paper was thick & hard to work with

4. [2] (Lang) Draw the crease pattern for the basic crossed pleat discussed in Chapter 7 and in class on 5/16.



skated (+.5)
notebook (+.5)
pattern of --- followed by --- (+.5)
90° repeat (+.5)

5. [3] Lockhart was "in the mood to think about shapes" in *The Mathematician's Lament*. What shapes did he start working with and what question did he ask? That is, what "little narrative" did he give to illustrate the mathematician's art?



How much area does the \triangle take in the rectangle?

skated (+.5)
true/in paper (+.5)
area question (+1)
rectangle w/ \triangle in it (+1)