

Key

tc core 102: Quiz 4

There are two sides to this quiz. You can use a calculator and a 5-sided 3x5" notecard with anything written or typed on it.

- [4] (10/30 Discussion) Critique the following "definition" of science: "Science is the study of the structure and behavior of the physical and natural world".

sketch (+.5)
 reasonable points made (+1)
 sense (+1)
 compare to other disciplines (+.5)
 (+1)

This definition might equally apply to someone's religion. In particular Greek mythology often had this characteristic of trying to understand + explain the structure + behavior of the physical and natural world.

[This definition is missing the scientific method - the methods used in the study. This would include falsifiable statements, repeatability, "good explanations" as described in the TED talk]

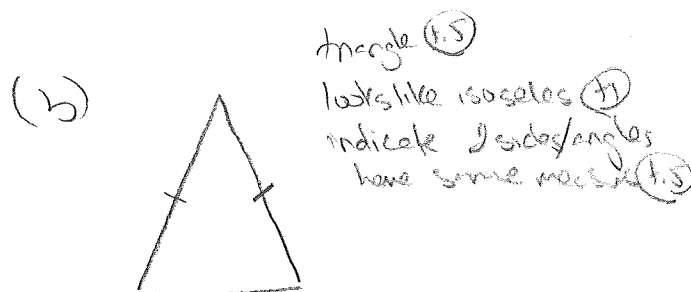
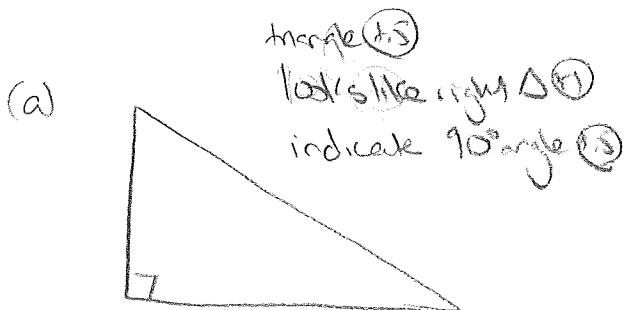
- [3] (11/1 Lecture) Describe some of the ways that Origami was used and taught when first created.

sketch (+.5)
 true (+1)
 related to origami (+1)
 sense (+.5)

Initially Origami was used for formal occasions since paper was scarce. The patterns developed were dogmatic that is people were not encouraged to personalize or experiment with designs. Common locations to use origami was weddings. The patterns were also generally not written down but passed on through a verbal tradition.

- [4] Draw an example for each of the following:

- Right triangle
- Isosceles triangle



a right Δ has one 90° angle

an isosceles Δ has two sides that are the same length.

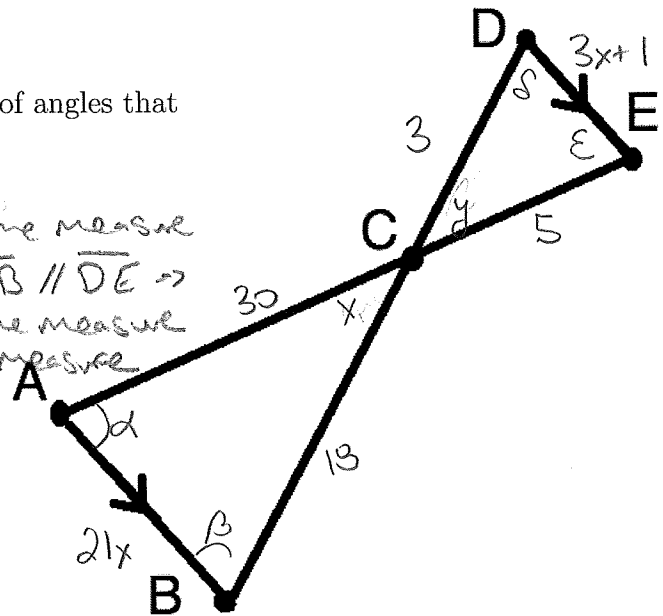
(or equivalently, two angles that have the same measure)

4. For the following questions consider the figure shown on the right.
Note that \overline{AB} is parallel to \overline{DE} .

- (a) [2] (Wheater §7.3) Identify a pair of angles that have the same measures.

start (1)
pair of angles (1.5)
got it (1)

Vertical angles \Rightarrow
 x & y have the same measure
Alt. interior angles and $\overline{AB} \parallel \overline{DE} \Rightarrow$
 α & ϵ have the same measure
 β & δ have the same measure



- (b) [1] Identify what kind of triangle $\triangle ABC$ is (acute? obtuse? right?).

\triangle type (1.5)
got it (1.5)

Acute

- (c) [3] (Wheater §7.4) Given that:

$$\frac{AB}{AC} = 21x, \frac{AC}{CE} = 30, \frac{CE}{DE} = 5, \frac{DE}{DC} = 3x+1, \frac{CB}{BC} = 18, \frac{DC}{CB} = 3.$$

Set up a true equation involving x that will allow you to solve for x .

looking for similar \triangle 's (1.5)

Note by (a)

$\triangle ABC$ is similar to $\triangle EDC$ (1)

So ratio of side lengths are equal

$$(1.5) \left[\frac{AB}{AC} = \frac{ED}{EC} \right]$$

$$(1) \left[\frac{21x}{30} = \frac{3x+1}{5} \right]$$

OR

$$\frac{AB}{BC} = \frac{ED}{DC}$$

$$\frac{21x}{18} = \frac{3x+1}{3}$$

Note: there are lots of equations that could be used?

- (d) [2] Find x from problem b above.

start (1.5)
simplify (1.5)
order up (1)

$$21x \cdot 5 = 30(3x+1)$$

$$105x = 90x + 30$$

$$15x = 30$$

$$-6x \quad -6x$$

$$x = 2$$

OR

$$21x \cdot 3 = 18(3x+1)$$

$$63x = 54x + 18$$

$$9x = 18$$

$$-6x \quad -6x$$

$$x = 2$$