Homework - due Fri 12 Feb
Ch 10 Review, pp. 421-424 #1-62

Final Exam: Wed 17 Feb 9-11am

wuz near

dont fail.

itchell Patterson

Def: The ratio of the number a to the number b is the number a/b.

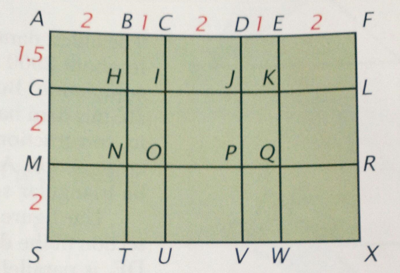
A proportion is an equality between ratios. a/b=c/d

a, b, c, and d are called the *first, second, third, and fourth terms*.
The second and third terms, b and c, are called the means.
The first and fourth terms, a and d, are called the extremes.

The product of the means is equal to the product of the extremes.
If a/b=c/d, then ad=bc.

Def: The number b is the geometric mean between the numbers a and c if a, b, and c are positive and a/b=b/c. $\angle$ betw. x & y $=\sqrt{xy}$

Def: Two triangles are similar iff there is a correspondence between their vertices such that their corresponding sides are proportional and their corresponding angles are equal.



How many sets of similar rectangles of different sizes can you find whose dimensions have each of the following ratios? Name the rectangles in each set and their dimensions.

1. $\frac{1}{2}$.
2. $\frac{1}{4}$.
3. $\frac{2}{3}$.
4. $\frac{3}{4}$.

2/3: GIOM, HJPN, IKQO, JLRP,
MOUS, NPVT, OQMU, PRXV

4/6: GKWS, HLXT

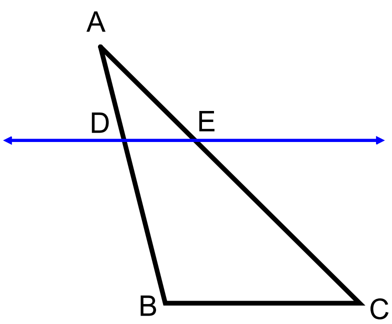
$\frac{1}{1.5} = \frac{1}{3/2} = \frac{3}{2}$: BCIH, DEKJ

3/4: GIUS, HJVT, IKWU, JLXV

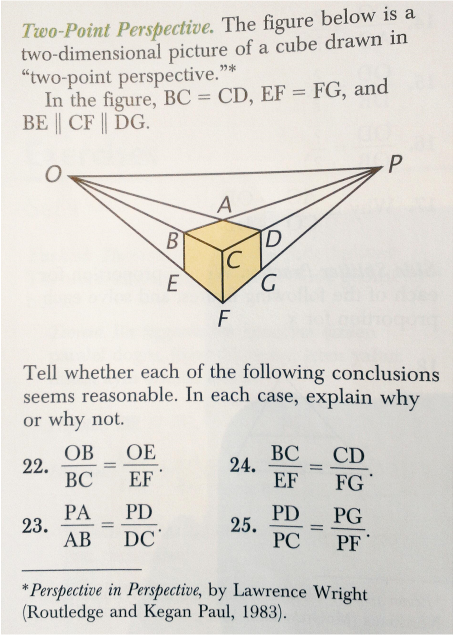
$\frac{1.5}{2}$: ABHG, CDJI, EFLK

<u>10.3 - The Side-Splitter Theorem</u>

<u>Theorem 44</u> - The Side-Splitter Theorem
If a line parallel to one side of a triangle intersects the other two sides in different points, it divides the sides in the same ratio, that is, if in triangle ABC, DE||BC, then AD/DB=AE/EC.



<u>Corollary to the Side-Splitter Theorem</u>:
If a line parallel to one side of a triangle intersects the other two sides in different points, it cuts off segments proprtional to the sides, that is,
AD/AB=AE/AC and DB/AB=EC/AC



Two-Point Perspective. The figure below is a two-dimensional picture of a cube drawn in "two-point perspective."*

In the figure, BC = CD, EF = FG, and BE ∥ CF ∥ DG.

Tell whether each of the following conclusions seems reasonable. In each case, explain why or why not.

22. $\frac{OB}{BC} = \frac{OE}{EF}$.

24. $\frac{BC}{EF} = \frac{CD}{FG}$.

23. $\frac{PA}{AB} = \frac{PD}{DC}$.

25. $\frac{PD}{PC} = \frac{PG}{PF}$.

Perspective in Perspective, by Lawrence Wright (Routledge and Kegan Paul, 1983).

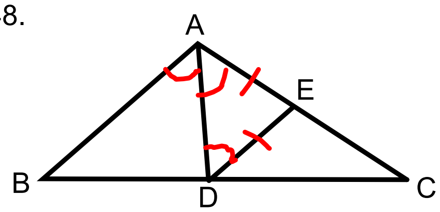
22. true - SS thm

23. false - AD & BC not ∥, so SS thm does not apply

24. true Given BC = CD & EF = FG

25. true - cor. to SS thm

48.



Given: In ΔABC, AD bisects ∠BAC, AE=ED

Prove: $\frac{AE}{EC} = \frac{BD}{DC}$

1. ∠BAD = ∠DAE — angle bisector divides ∠s into 2 equal parts
2. ∠DAE = ∠ADE — if 2 sides of a Δ are =, the ∠s opposite them are =
3. ∠BAD = ∠ADE — Substitution
4. BA ∥ DE — equal alternate interior ∠s mean lines are parallel
5. $\frac{AE}{EC} = \frac{BD}{DC}$ — Corollary to Side-Splitter Theorem

10.4 - AA Similarity

Theorem 45 - The AA Theorem - If two angles of one triangle are equal to two angles of another triangle, the triangles are similar.

Corollary to the AA Theorem - Two triangles similar to a third triangle are similar to each other.

Piero della Francesca, an important painter of the 15th century, was also a mathematician. In his book *On Perspective for Painting*, he proved the following theorem:

"If above a line divided into several parts a line be drawn parallel to it and from the points dividing the first line there be drawn lines which are concurrant, they will divide the parallel line in the same proportion as the given line."

View of an Ideal City, 1460

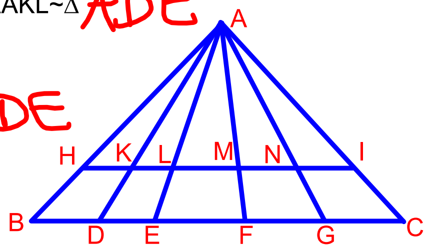
19. What does this theorem say about lines BC and HI?

$BC \parallel HI$

20. What does the word "concurrent" mean?

intersect / have a point in common

21. Complete the similarity correspondences: $\triangle AHK \sim \triangle$ ABD and $\triangle AKL \sim \triangle$ ADE



22. Complete the proportions: HK/ BD =AK/ AD and AK/ AD =KL/ DE

23. What proportion follows directly from these two proportions?

$HK/BD = KL/DE$