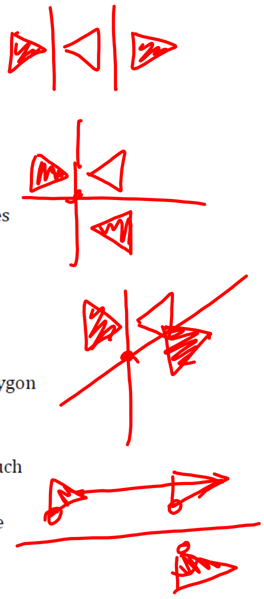
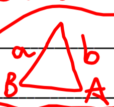
1. M Isometry
2. K Betweenness of Points Theorem
3. O Diagonal
4. F Supplementary angles
5. J Transversal
6. Q Betweenness of Rays Theorem
7. R Congruent triangles
8. P Rectangle
9. H Parallel lines
10. A Midsegment
11. D Parallelogram
12. S Glide reflection
13. T Rhombus
14. E Exterior angle
15. C Translation
16. L Square
17. N Perpendicular lines
18. B Trapezoid
19. G Transformation
20. I Rotation

A. A line segment that connects the midpoints of two sides of a triangle
B. Quadrilateral that has exactly one pair of parallel sides
C. The composite of two successive reflections through parallel lines
D. Quadrilateral whose opposite sides are parallel
E. Angle that forms a linear pair with an angle of a triangle
F. Angles whose sum is 180°
G. A one-to-one correspondence between two sets of points
H. Lines in the same plane that do not intersect
I. The composite of two successive reflections through intersecting lines
J. Line that intersects two or more lines in different points
K. If A-B-C, then AB+BC=AC
L. Quadrilateral all of whose sides and angles are equal
M. A transformation that preserves distance and angle measure
N. Two lines forming a right angle
O. Line segment that connects any two nonconsecutive vertices of a polygon
P. Quadrilateral each of whose angles is a right angle
Q. If OA-OB-OC, then ∠AOB+∠BOC=∠AOC
R. Two triangles possessing a correspondence between their vertices such that all of their corresponding sides and angles are equal
S. The composite of a translation and a reflection in a line parallel to the direction of the translation
T. Quadrilateral all of whose sides are equal

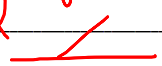


21. An exterior angle of a triangle is equal to the sum of the two remote interior angles
22. The diagonals of a rhombus are perpendicular
23. The base angles of an isosceles trapezoid are equal
24. Parallel lines form supplementary interior angles on same side of transversal
25. The diagonals of a parallelogram bisect each other

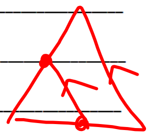


If A > B, then a > b

26. The diagonals of an isosceles trapezoid are equal
27. If two angles of a triangle are unequal, the sides opposite them are unequal in the same order
28. Equal alternate interior angles mean that lines are parallel



29. The angles in a linear pair are supplementary

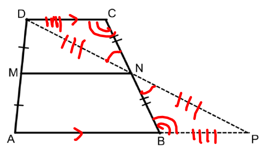


30. A midsegment of a triangle is parallel to the third side

and half as long as the third side

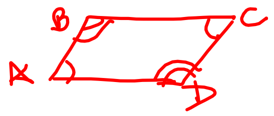
& vertical ∠'s

Theorem: The midsegment of a trapezoid is parallel to the bases and has length equal to the average lengths of the bases.
Given: M and N are midpoints of the legs of trapezoid ABCD
Prove: MN||AB, MN||DC, and $MN = \frac{1}{2}(AB + DC)$



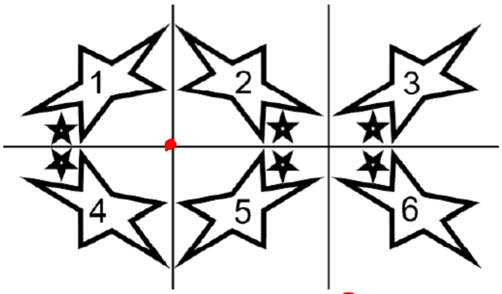
Statements	**Reasons**
ABCD is a trapezoid with bases AB and DC	Given
Draw line DN and extend AB to intersect it at P	Two points define a line
31. ∠DNC=∠PNB	vertical angles are equal
32. DC||AB	the two bases of a trapezoid are parallel
∠DCN=∠PBN	Parallel lines form equal alternate interior angles
33. $\Delta DNC \cong \Delta PNB$	ASA congruence
34. DN=PN	corresponding parts of congruent Δ's are equal
35. N is the midpoint of DP	point N divides line segment DP into 2 equal parts
MN is a midsegment of triangle ADP	Definition of midsegment of a triangle
36. MN||AB	Midsegment Theorem (midsegment of a Δ is parallel to 3rd side)
37. DC ll MN	Two lines parallel to the same line are parallel to each other
38. DC=BP	corresponding parts of congruent Δ's are equal
39. AP=AB+BP	Betweenness of Points Theorem
40. AP=AB+DC	Substitution (#38 & 39)
41. $MN = \frac{1}{2}AP$	Midsegment Theorem (midsegment of Δ is half as long as 3rd side)
42. $MN = \frac{1}{2}(AB + DC)$	Substitution (#40 & 41)

Theorem: A quadrilateral is a parallelogram if its opposite angles are equal.
Given: In quadrilateral ABCD, ∠A=∠C and ∠B=∠D



43. *Prove*: ABCD is a parallelogram

Statements	**Reasons**
Quadrilateral ABCD with ∠A=∠C and ∠B=∠D	Given
44. ∠A+∠B+ ∠C+∠D=360°	Quadrilateral Sum Theorem (sum of ∠'s in a quadrilateral is 360°)
45. ∠A+∠B+∠A+∠B=360° 2∠A+2∠B=360°	Substitution & Simplification
46. ∠A+∠B=180°	Division
47. ∠A+∠D=180°	Substitution with given information and previous statement.
48. ∠A and ∠B are supplementary ∠A and ∠D are supplementary	supplementary ∠'s sum to 180°
49. AD||BC and AB||DC	supplementary interior ∠'s on same side of transversal means lines are parallel
50. ABCD is a parallelogram	a quadrilateral w/ 2 pairs of opposite sides parallel is a parallelogram



51. What type of transformation takes object 1 to object 2? reflection

52. What type of transformation takes object 1 to object 3? translation

53. What type of transformation takes object 1 to object 4? reflection

54. What type of transformation takes object 1 to object 5? rotation (180° or 2-fold)

55. What type of transformation takes object 1 to object 6? glide reflection

Postulate 8 - The Area Postulate
Every polygonal region has a positive number called its area such that
(1) congruent triangles have equal areas
(2) the area of a polygonal region is equal to the sum of the areas of its nonoverlapping parts

Postulate 9 - The area of a rectangle is the product of its base and altitude

Corollary to Postulate 9 - The area of a square is the square of its side

Theorem 38 - The area of a right triangle is half the product of its legs.

Theorem 39 - The area of a triangle is half the product of any base and corresponding altitude.

Corollary to Theorem 39 - Triangles with equal bases and equal altitudes have equal areas.

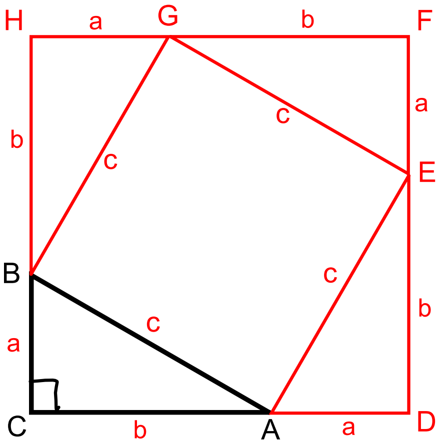
Heron's Theorem - The area of a triangle with sides a, b, and c is $\sqrt{s(s-a)(s-b)(s-c)}$ where s is half of the triangle's perimeter.

Theorem 40 - The area of a parallelogram is the product of any base and corresponding altitude.

Theorem 41 - The area of a trapezoid is half the product of its altitude and the sum of its bases.

9.5 - The Pythagorean Theorem

Theorem 42 (The Pythagorean Theorem) - The square of the hypotenuse of a right triangle is equal to the sum of the squares of its legs.



Given: right $\triangle ABC$ with hypotenuse c and legs a & b

Prove: $c^2 = a^2 + b^2$

$\alpha HFDC = (a+b)^2$

$\alpha HFDC = c^2 + 4\left(\frac{1}{2}ab\right)$

$(a+b)^2 = c^2 + 2ab$

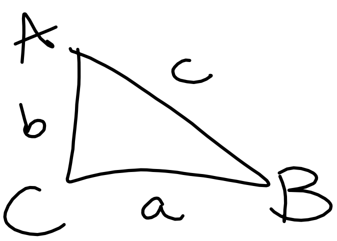
$(a+b)(a+b)$

$a^2 + ab + ab + b^2$

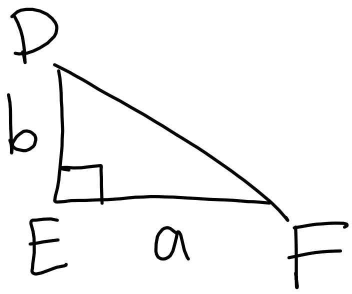
$a^2 + 2ab + b^2 = c^2 + 2ab$

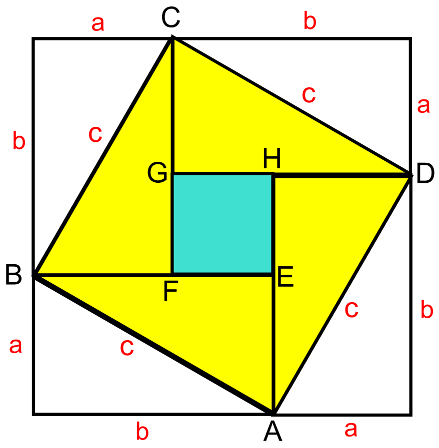
$a^2 + b^2 = c^2$

Theorem 43 (Converse of the Pythagorean Theorem) - If the square of one side of a triangle is equal to the sum of the squares of the other two sides, the triangle is a right triangle.



$\triangle ABC$ w/ $a^2 + b^2 = c^2$





If the area of square EFGH is 1 unit, what is the area of

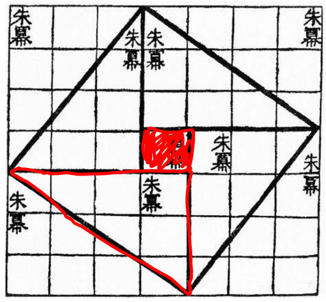
33. triangle ABE?

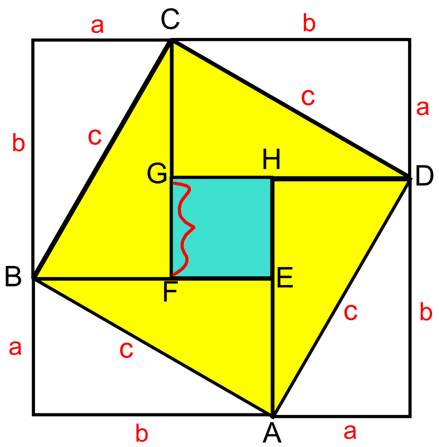
$\frac{1}{2}(4)(3) = 6$ units

34. the yellow region?

$4(6) = 24$ units

35. square ABCD? $= 24 + 1 = 25$ units





In terms of a and b, what is the area of

36. triangle ABE?

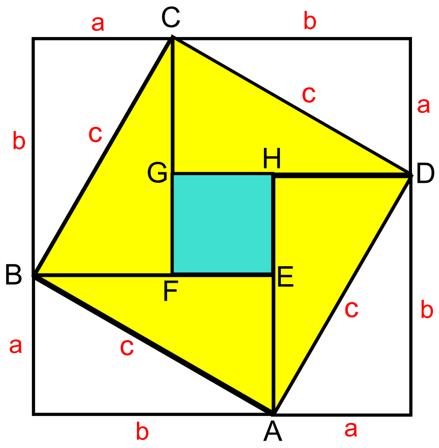
$\frac{1}{2}ab$

37. the yellow region?

$4(\frac{1}{2}ab) = 2ab$

38. square EFGH?

$(b-a)^2$



39. Write two expressions for the area of square ABCD, one in terms of a nd b and the other in terms of c.

$2ab + (b-a)^2 = c^2$

$2ab + b^2 - 2ab + a^2 = c^2$

40. Use these two expressions to derive the Pythagorean Theorem.

$b^2 + a^2 = c^2$

Bring your compass & straightedge to class every day this week.

HW #8 (due Fri. Jan 23)

- Ch 9 Review (pp.371-375)

Take-home Quiz #? Compass & Straightedge Constructions (due Fri. Jan 30)
On plain white 8.5"x11" paper, minding neatness and accuracy, complete the following constructions:

- Basic constructions #1-13
- 1 equilateral triangle (3-gon) - either #5 or 49
- 1 hexagon (6-gon) - either #3 or 51
- 1 dodecagon (12-gon) - either #52, 53, or 54
- 1 octagon (8-gon) - either #57, 58, or 59
- 1 pentagon (5-gon) - either #117, 119, 120, or 121
- 1 decagon (10-gon) - either #118 or 122