chapter 6 - relating lines to planes

VOCAB

plane - a surface such that if any two points on the surface are connected by a line, all points of the line are also on the surface.

noncoplanar - not on the same plane.

coplanar - on the same plane.

foot - point of intersection of a line and a plane.

POSTULATES

Three noncollinear points determine a plane.

If a line intersects a plane not containing it, then the intersection is exactly one point.

If two planes intersect, their intersection is exactly one line.

THEOREMS

A line and a point not on the line determine a plane.

Two intersecting lines determine a plane.

Two parallel lines determine a plane.

If a line is perpendicular to 2 distinct lines that lie on a plane and that pass through its foot, then it is perpendicular to the plane.

If a plane intersects 2 parallel planes, the lines of intersection are parallel.

chapter 8 - ratio and proportion

THEOREMS

Means-Extremes Products Theorem - a/b = c/d -> ad=bc

Means-Extremes Ratio Theorem - pq=rs -> p/r=s/q etc.

Arithmetic mean example: given 3 & 7, 3+27/2= 15

Geometric mean example: given 3 & 7, 3/x = x/27 x=+ or - 9

AAA (angles) - similar

AA (angles) - similar

Side-Splitter Theorem - ab/bc = ae/ed

TERMS

Dilation/Reduction

Similarity - same shape but not size

chapter 10 - circles

TERMS

concentric circle - same center with different size

chord - points connected by a segment on a circle

diameter/radius

secants/tangents

THEOREMS

If a radius is perpendicular to a chord then it bisects it (reversed too).

The perpendicular bisector of a chord passes through the center of a circle.

If 2 chords are equidistant from the center then they are congruent (reversed too).

secant/tangent theorems - example: 1/2 (large angle - medium angle) = small angle

chords: ev . en = el . se

tp (tangent) squared = (pr)(pq aka external part of secant)

pb . pa (external part of secant) = pd . pc (external part of secant)

chapter 12

TERMS

bases

lateral faces

lateral edges

slant height

altitude (height)

LA: Lateral surface area - no bases

TA: Total surface area - with bases

volume

chapter 7 - triangle application theorems

THEOREMS

The sum of the measures of the 3 angles of a triangle is 180.

The measure of an exterior angle of a triangle is equal to the sum of the measures of the remote interior angles.

chapter 7 - triangle application theorems (cont)

A segment joining the midpoints of 2 sides of a triangle is parallel to the third side, and its length is one-half the length of the third side (midline theorem).

No choice theorem - if 2 angles of a triangle are congruent then the remaining ones are also.

AAS - angle angle side

FORMULAS

sum of angles in polygon = (sides - 2)180

exterior angles = 360

diagonals = sides(sides - 3)/2

exterior angle = 360/sides

chapter 9 - a lot of different things

RADICAL REVIEW

squared root of 48 = 4 radical 3

squared root of 5/3 = squared root of 15/3

CIRCLES

circumference - pi d

area - pi r squared

sector - fraction of circle area

arc - fraction of circumference

secants - through circle

tangent - edge of circle (external/internal)

RIGHT TRIANGLE ALTITUDES

h squared = x . y

a squared = x . c

b squared = y . c

OTHER

pythagorean theorem - a squared + b squared = c squared

distance formula - squared root (x2 - x1) squared + (y2 - y1) squared

30 60 90

45 45 90

SOH CAH TOA

chapter 11 - area

I don't feel like writing all of the area formulas but here are the ones you need to know...

square/rectanle

triangle

parallelogram

trapezoid (and median)

kite

polygons

circle, sectors, segments

hero formula: squared root of s(s-a)(s-b)(s-c)