Chapter 3 – Parallel Lines and Planes

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| Topics, Vocabulary | Details |
| Lines | Parallel and Skew lines do not intersect |
|  | Parallel are Co-Planar lines (segments or rays) that do not intersect. || |
|  | Skew lines – non-coplanar – neither parallel nor intersecting. |
|  | Parallel planes. A line and a plane can be parallel. |
| Th 3-1 | If two parallel planes are cut by a third plane then the lines of intersection are parallel. |
|  | Transversal – line that intersects two or more coplanar lines in different points. |
|  | Naming angles by their position: Interior and ExteriorPairs of angles: Alternate Interior/Exterior.Same-side Interior, Corresponding |
| Measuring Angles with a Protractor |  |
| Postulate 10 | If two parallel lines are cut by a transversal, then corresponding angles are congruent. |
| Th 3-2 | If two parallel lines are cut by a transversal, then alternate interior angles are congruent. |
| Th 3-3 | If two parallel lines are cut by a transversal, then same-side interior angles are supplementary. |
| Th 3-4 | If a transversal is perpendicular to one of two parallel lines, then it is perpendicular to the other one also. |
| Postulate 11 | If two lines are cut by a transversal and corresponding angles are congruent, then the lines are parallel. |
| Th 3-5 | If two lines are cut by a transversal and alternate interior angles are congruent then the lines are parallel. |
| Th 3-6 | If two lines are cut by a transversal and same-side interior angles are supplementary, then the lines are parallel. |
| Th 3-7 | In a plane, two lines perpendicular to the same line are parallel. |
| 3-Theorems | -Through a point outside a line, there is exactly one parallel to the given line.- Through a point outside a line, there is exactly one line perpendicular to the given line.- Two lines parallel to a third line are parallel to each other. |
|  | 5 ways to prove two lines are parallel. |
| Triangles | Vertices, Interior angles, Exterior angles |
|  | Classifying by length of sides.Classifying by angles. |
| Th | The sum of the measures of the angles of a triangle is 180° |
| Corollaries | If two angles of a triangle are congruent to two angles of another triangle, then the third angles are congruent.Each angle of an equilateral triangle has measure 60°In a triangle, there can be at most one right angle or obtuse angle.The acute angles of a right triangle are complementary. |
| Th | The measure of an exterior angle of a triangle equals the sum of the measures of the two remote interior angles. |

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| Topics, Vocabulary | Details |
| Polygons | “Many Angles”Naming Polygons – letter the vertices either clockwise or counter. |
|  | Classifying polygons by number of sides.Triangle, Quadrilateral, Pentagon, Hexagon, Heptagon, Octagon, Nonagon, Decagon, n-gon |
|  | Convex vs Concave PolygonsDiagonal connects two non-consecutive vertices. |
|  | Sum of polygon angle measures. |
| Polygon Angle Sum Th | The sum of the measures of the angles of a convex polygon with n sides is (n-2)180 |
| Polygon Exterior Angle sum Th | The sum of the measures of the exterior angles of any convex polygon, one angle at each vertex is 360 |
|  | Regular polygons – examples.  |
| Inductive Reasoning | Looking for patterns that extend rather than patterns that fill-in. |
|  | Fibonacci Sequence. |
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| Summary |
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