

**Book sections**

- §4.1 Detours and midpoints
- §4.2 The case of the missing diagram
- §4.4 The Equidistance theorems
- §4.6 Slope

§9.5 Distance formula

§13.1 Graphing equations

§13.2 Equations of lines

**Proof Techniques**

- detour proofs
- proofs without pictures

**Theorems**

**PBT (perpendicular bisector theorem)**

*If a point is on the perpendicular bisector of a segment, **then** it is equidistant from the endpoints of the segment.*

**PBT converse**

*If a point is equidistant from the endpoints of a segment, **then** it lies on the perpendicular bisector of the segment.*

or

*If two points are each equidistant from the endpoints of a segment **then** the two points determine the perpendicular bisector of that segment.*

**Angle bisector theorem**

*If a point is on the bisector of an angle, **then** the point is equidistant from the sides of the angle.*

**Angle bisector theorem converse**

*If a point is equidistant from the sides of an angle, **then** it is on the angle bisector.*

**Algebra Review**

midpoint,  $M\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

distance,  $d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$

slope,  $m = \frac{y_1 - y_2}{x_1 - x_2}$

slope-intercept,  $y = mx + b$

point-slope,  $y - y_1 = m(x - x_1)$

parallel lines,  $p \parallel q \Rightarrow m_p = m_q$

perpendicular lines,  $r \perp s \Rightarrow m_r = -1/m_s$

**Definitions**

- perpendicular bisector
- median
- altitude
- angle bisector

**Other Concepts to Know**

**Triangle congruence postulates**

SSS, SAS, ASA, AAS, HL

**Properties**

addition, subtraction, multiplication, division

**Properties of congruence (or equality)**

reflexive, symmetric, transitive, substitution

**Definitions**

- perpendicular
- midpoint
- isosceles triangle
- midsegment
- bisect, trisect
- CPCTC

**Theorems**

Base angles theorem

Base angles theorem converse

Congruent supplements theorem

Congruent complements theorem

**If** 2 angles are right angles, **then** they are congruent.