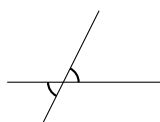


REFERENCE TABLES FOR
EUCLID'S ELEMENTS BOOK I

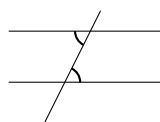
Viktor Blåsjö

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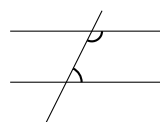
Prop.	Construction	Theorem	
1	draw equilateral \triangle		
2	move segment		
3	cut off given length		
4		SAS \triangle congruence	\perp
5		isosceles $\triangle \Rightarrow$ base angles equal	
7		SSS uniqueness	\perp
8		SSS \triangle congruence	\perp
9	bisect angle		
10	bisect segment		
11	draw perpendicular		
13		angle on one side of straight line = 2r	
14		angle on one side = $2\text{r} \Rightarrow$ straight line	\perp
15		vertical angles equal	
16		\triangle external angle $>$ each opposite internal angle	
22	draw \triangle from three segments		
23	move angle		
26		ASA \triangle congruence	\perp
27		alternate angles equal \Rightarrow parallel	\perp
29		parallel \Rightarrow alternate angles equal, ... internal angles = 2r	\perp
30		parallel to same \Rightarrow parallel to each other	
31	draw parallel through point		
32		\triangle angle sum = 2r	
34		$\square \Rightarrow$ opposite sides, angles equal; diagonal bisects	
35		\square w same base, height \Rightarrow equal area	
37		\triangle w same base, height \Rightarrow equal area	
41		\square area = $2 \times$ corresponding \triangle area	
46	draw a square		
47		right-angle $\triangle \Rightarrow a^2 + b^2 = c^2$	
48		$a^2 + b^2 = c^2 \Rightarrow$ right-angle \triangle	



vertical angles
(X angles)



alternate angles
(Z angles)



internal angles
(F angles)



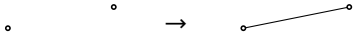
internal angles



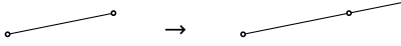
external angle

CONSTRUCTIONS

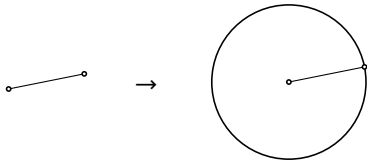
Postulate 1: draw line between points.



Postulate 2: extend line.



Postulate 3: draw circle.



Proposition 1: draw equilateral Δ .



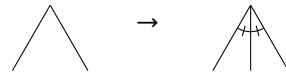
Proposition 2: move segment.



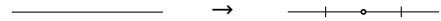
Proposition 3: cut off given length.



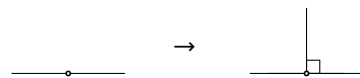
Proposition 9: bisect angle.



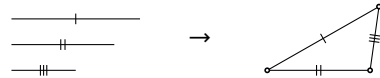
Proposition 10: bisect segment.



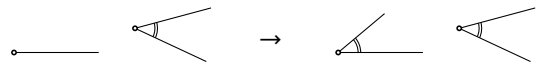
Proposition 11: draw perpendicular.



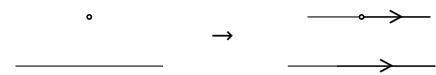
Proposition 22: draw Δ from three segments.



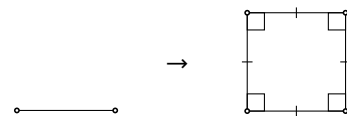
Proposition 23: move angle.



Proposition 31: draw parallel through point.

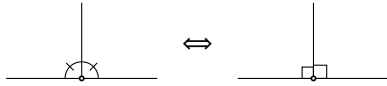


Proposition 46: draw a square.

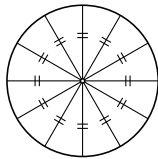


INFERENCES

Definition 10: right angle.



Definition 15: circle.



Common Notion 1: transitivity.

$$\begin{aligned} A &= C \\ B &= C \\ \Rightarrow A &= B \end{aligned}$$

Common Notion 2: additivity.

$$\begin{aligned} A &= C \\ B &= D \\ \Rightarrow A + B &= C + D \end{aligned}$$

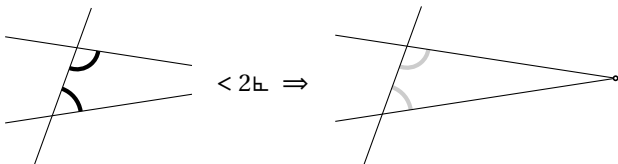
Common Notion 3: subtractivity.

$$\begin{aligned} A &= C \\ B &= D \\ \Rightarrow A - B &= C - D \end{aligned}$$

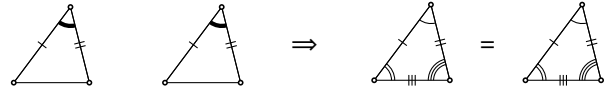
Postulate 4: identity of right angles.

$$\sphericalangle = \sphericalangle$$

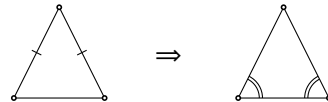
Postulate 5: condition for crossing.



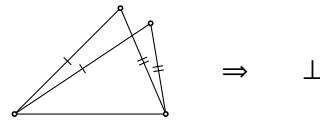
Proposition 4: SAS \triangle congruence.



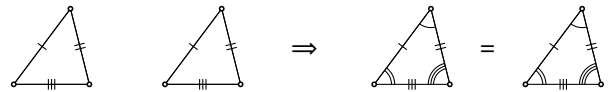
Proposition 5: isosceles $\triangle \Rightarrow$ base angles equal.



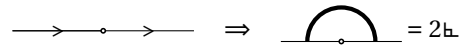
Proposition 7: SSS uniqueness.



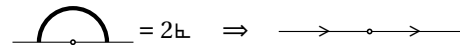
Proposition 8: SSS \triangle congruence.



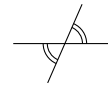
Proposition 13: angle on one side of straight line = $2r$.



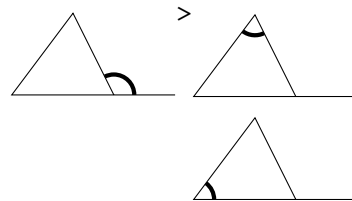
Proposition 14: angle on one side = $2r \Rightarrow$ straight line.



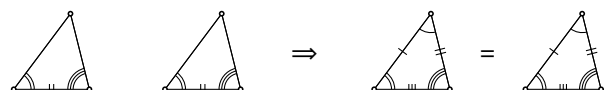
Proposition 15: vertical angles equal.



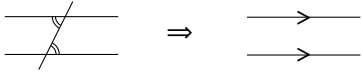
Proposition 16: \triangle external angle $>$ each opposite internal angle.



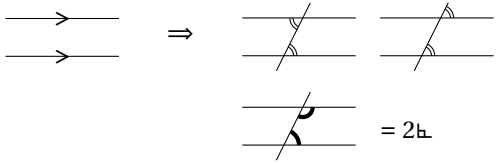
Proposition 26: ASA \triangle congruence.



Proposition 27: alternate angles equal \Rightarrow parallel.



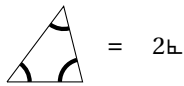
Proposition 29: parallel \Rightarrow alternate angles equal, ... internal angles = 2r .



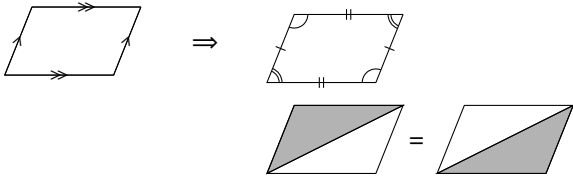
Proposition 30: parallel to same \Rightarrow parallel to each other.



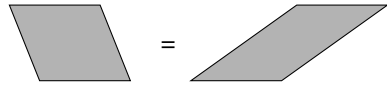
Proposition 32: \triangle angle sum = 2r .



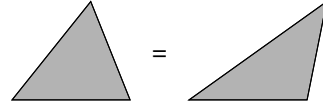
Proposition 34: $\square \Rightarrow$ opposite sides, angles equal; diagonal bisects.



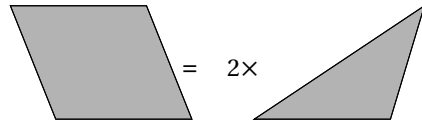
Proposition 35: \square w same base, height \Rightarrow equal area.



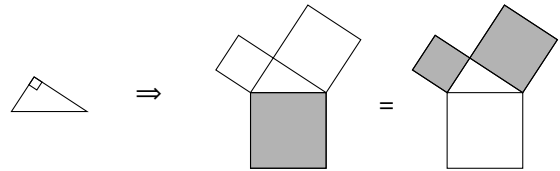
Proposition 37: \triangle w same base, height \Rightarrow equal area.



Proposition 41: \square area = $2 \times$ corresponding \triangle area.



Proposition 47: right-angle $\triangle \Rightarrow a^2 + b^2 = c^2$.



Proposition 48: $a^2 + b^2 = c^2 \Rightarrow$ right-angle \triangle .

