Chapter 2 Review: Geometry

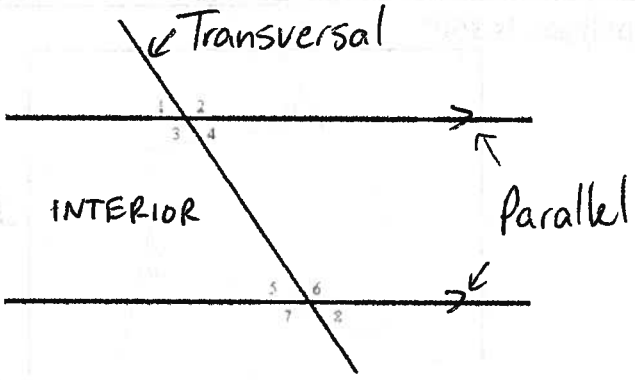
Textbook p70-106
Summary: p.84-85,105
Practice Questions p.106

Key Concepts:

Basic Rules

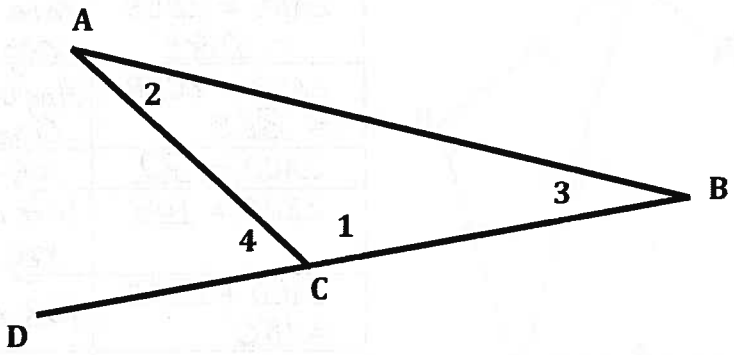
1) Angles on a line are Supplementary (add to 180°)
2) Angles within a right angle are Complimentary (add to 90°)
3) Angles at a point add to 360°
4) Vertically opposite angles are equal
5) All radii within a circle are equal
6) In an isosceles triangle, equal angles are opposite equal sides

Parallel Lines



1) Corresponding Angles are Equal (1=5, 2=6, 3=7, 4=8)
2) Alternate Interior Angles are Equal (4=5, 3=6)
3) Co Interior Angles are Supplementary (3+5=180, 4+6=180)

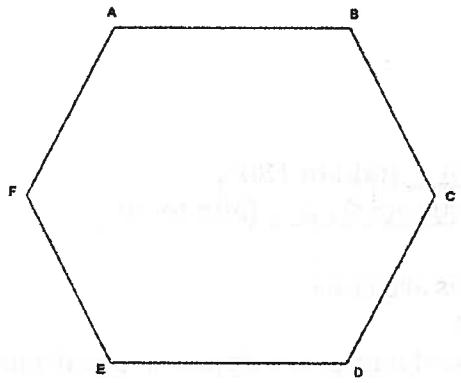
Angles in a Triangle



1) Angles in a Triangle Add to 180 Degrees (1+2+3=180)
2) The External Angle in a Triangle Equals the Sum of the Opposite Interior Angles (4=2+3)

Angles in a Polygon

1) The sum of the measures of the interior angles of a convex polygon with n sides can be expressed as $180°(n-2)$.



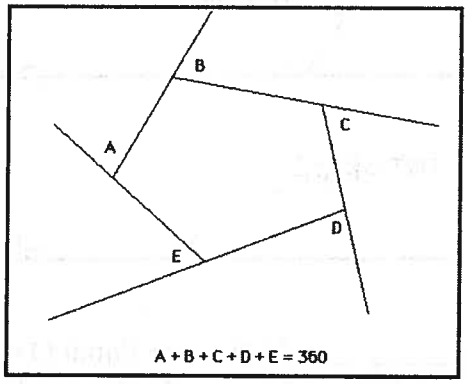
Example: If a shape has 6 sides, then the sum of the interior angles is

$= 180°(6-2)$
$= 180°(4)$
$= 720°$

That means that if all the angles are equal (it is a regular **polygon** and each angle is

$720° \div 6 = 120°$

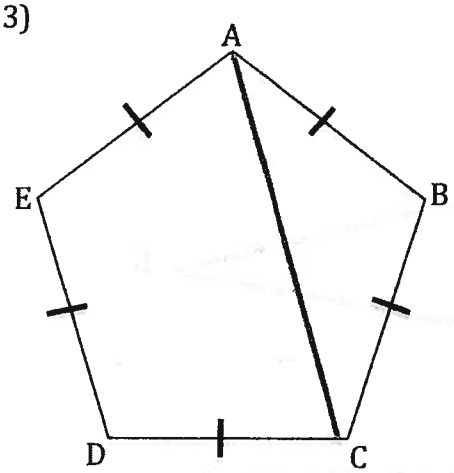
2) The sum of the measures of the exterior angles of any convex polygon is 360°.



In a REGULAR polygon $\frac{360°}{5} = 72°$ for each angle

Key Example: Given that ABCDE is a regular pentagon, prove that $AC \parallel ED$

3)

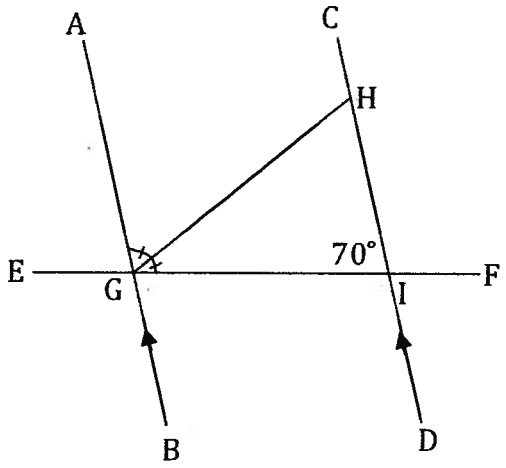


Statement	Reason
$\angle ABC = \angle DCB = 108°$	Interior angles of regular polygon
$\angle ACB = \angle CAB = 36°$	Angles of a triangle (isosceles) = 180
$\angle ACD = 72$	108 − 36 = 72
$\angle EDC = 108$	Interior angles of regular polygon
$\angle ACD + \angle EDC = 180$	108 + 72 = 180
$AC \parallel ED$	Co-interior angles are supplementary

Note: It is important not to assume that the lines are parallel or use it as a reason early in the proof. That would be called circular reasoning (and be logically incorrect).

Chapter 2 Review: Geometry

Practice #1: Find each angle and give a reason.



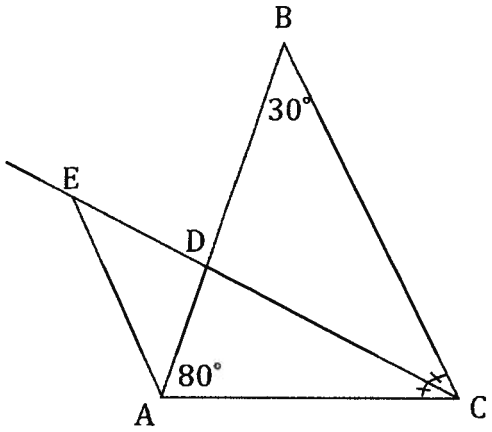
∠DIF = 70° vertically opposite

∠DIG = 110° Supplementary

∠BGI = 70° alternate interior or co-interior

∠HGI = 55 Supplementary ÷2

Practice #2: Find each angle and give a reason.



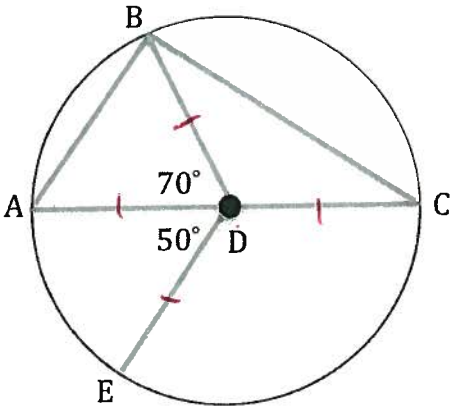
∠DCA = 35° angles of Δ = 180, ÷2

∠ADC = 65° angles of Δ = 180

∠EDA = 115° Supplementary

∠EDB = 65° vertically opposite (or supplementary)

Practice #3: Find each angle and give a reason



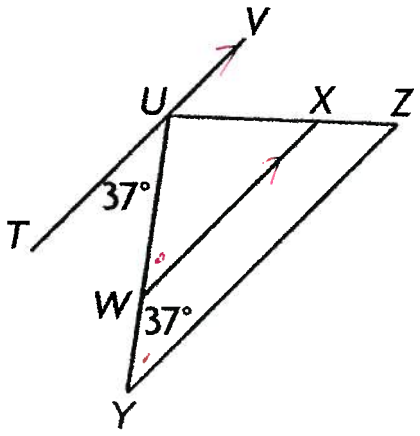
∠ABD = 55° radii equal, isosceles

∠BDC = 110° Supplementary

∠BCD = 35° radii equal, isosceles

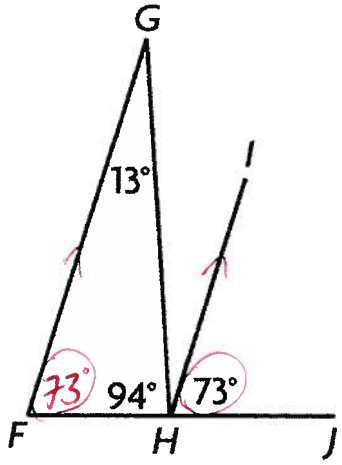
∠EDC = 130° Supplementary (or angles from point)

Practice #4: Given $\angle UWX = \angle WYZ$, prove: $TV \parallel WX$



Statement	Reason
$\angle WYZ = \angle TUW = 37°$	given in picture
$\angle UWX = \angle WYZ$	given
$\angle UWX = 37°$	substitution
$\angle UWX = \angle TUW$	both = 37°
$TV \parallel WX$	alternate interior angles are equal

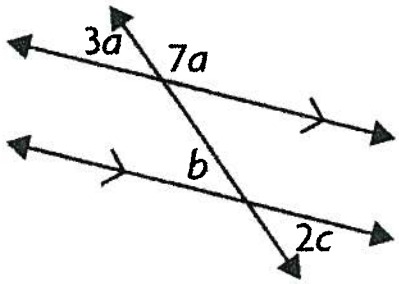
Practice #5: Prove: $FG \parallel HI$



Statement	Reason
$\angle GFH = 73°$	$\angle$s in $\triangle = 180$
$\angle IHJ = 73°$	given in picture
$\angle GFH = \angle IHJ$	both = 73°
$FG \parallel HI$	corresponding angles are equal.

*could also show $\angle GHI$ is 13°, then use alt. int.

Practice #6: Determine the values of *a*, *b*, and *c*.



$3a + 7a = 180$

$10a = 180$

$a = 18$

$3a = b$

$3(18) = b$

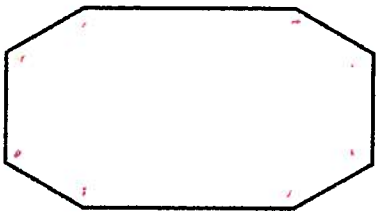
$b = 54$

$2c = b$

$2c = 54$

$c = 27$

Practice #7: Determine the sum of the measures of the interior angles of this polygon.



$n = 8$

$S = 180(8-2)$

$S = 1080°$

Practice #8: Each interior angle of a regular convex polygon measures 162°. How many sides does the polygon have?

$162n = 180(n-2)$

$162n = 180n - 360$

$360 = 18n$

$n = \frac{360}{18}$

$n = 20$

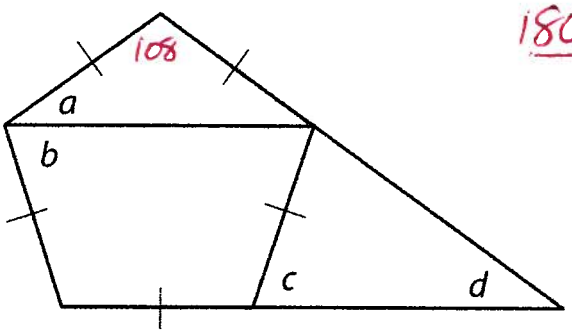
Practice #9: The interior angles of a regular convex polygon add to 2340°. How many sides does the polygon have?

$2340 = 180(n-2)$

$\frac{2340}{180} + 2 = n$

$n = 15$

Practice #10: Determine the value of *a*, *b*, *c*, *and d*.



$\frac{180(5-2)}{5} = 108°$

$a = 36°$

$b = 72°$

$c = 72°$

$d = 36°$