# Review Sheet

Proofs We Have Discussed and will be on the quiz

↳ You don't need to memorize them word-for-word. But definitely understand how they work!
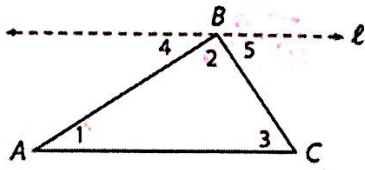
Statements	Reasons
1. Draw line ℓ through point B parallel to $\overline{AC}$.	1. Parallel Postulate) Can just say "given"
2. $m\angle 1 = m\angle$ __4__ and $m\angle 3 = m\angle$ __5__	2. Alternate Interior Angles Theorem
3. $m\angle 4 + m\angle 2 + m\angle 5 = 180°$	3. Angle Addition Postulate and definition of straight angle ↳ Don't really need AAP
4. $m\angle$ __1__ $+ m\angle 2 + m\angle$ __3__ $= 180°$	4. Substitution Property of Equality
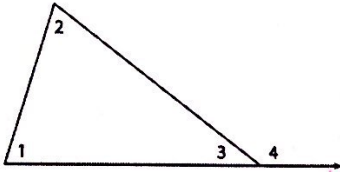
By the __Triangle Sum Theorem__, $m\angle 1 + m\angle 2 + m\angle 3 = 180°$.

Also, $m\angle 3 + m\angle 4 =$ __180°__ because they are supplementary and make a straight angle.

By the Substitution Property of Equality, then, $m\angle 1 + m\angle 2 + m\angle 3 = m\angle$ __3__ $+ m\angle$ __4__.

Subtracting $m\angle 3$ from each side of this equation leaves __$m\angle 1 + m\angle 2 = m\angle 4$__.

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

Critical Thinking Prove $\angle B \cong \angle C$, given point M is the midpoint of $\overline{BC}$.
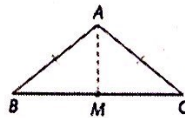
Statements	Reasons
1. M is the midpoint of $\overline{BC}$.	1. Given
2. $\overline{BM} \cong \overline{CM}$	2. Definition of midpoint
3. $\overline{AB} \cong \overline{AC}$	3. Given
4. $\overline{AM} \cong \overline{AM}$	4. Reflexive Property of Congruence
5. $\triangle AMB \cong \triangle AMC$	5. SSS Triangle Congruence Theorem
6. $\angle B \cong \angle C$	6. CPCTC

1. How do you find the sum of the interior angles of a polygon?

Subtract 2 from the number of sides. This gives you the number of triangles. Then multiply that number by 180°. $(Sum = (n-2) \cdot 180)$

2. How many sides does a polygon with an interior angle sum of 2700° have?

$$\frac{2700}{180} = \frac{(n-2)180}{180} \rightarrow 15 = n-2 \rightarrow 17 = n \quad \boxed{17 \text{ sides}}$$
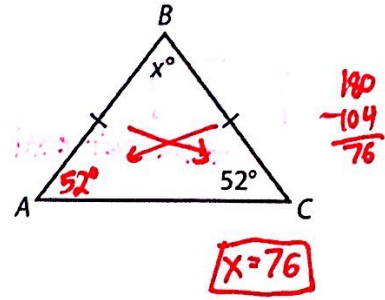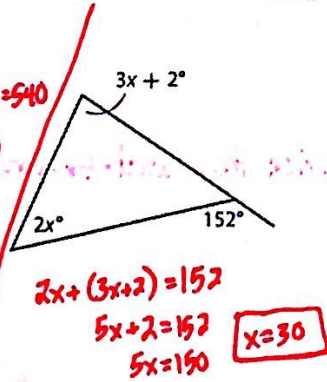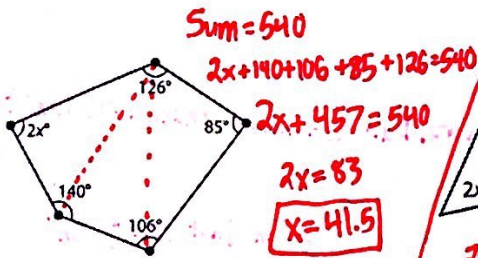$$+2 \quad +2$$

3. What is the measure of (an) interior angle of a regular pentagon?
one

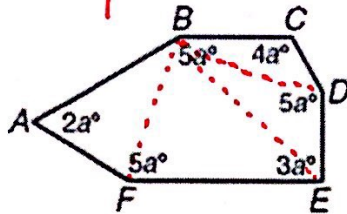$Sum = 3 \cdot 180 = 540°$ One Angle $= \frac{540}{5} = \boxed{108°}$

4. Find the value of x in each.

Sum = 540
2x + 140 + 106 + 85 + 126 = 540
2x + 457 = 540
2x = 83
$x = 41.5$

126°
2x°
85°
140°
106°

3x + 2°
2x°
152°

2x + (3x+2) = 152
5x + 2 = 152
5x = 150
$x = 30$

B
x°
52°   52°
A   C

180
−104
 76

$x = 76$

Find the value of a. →

B   C
59° 4a°
5a° D
A 2a°
5a°   3a°
F   E

Sum = 4·180 = 720°
2a + 5a + 3a + 5a + 4a + 5a = 720
24a = 720°
$a = 30$

5. Name the sides from smallest to largest.

59
+ 1
120

180
−120
 60

60°
real
small   big
G 59°   61° H

$\overline{HI}, \overline{GH}, \overline{GI}$
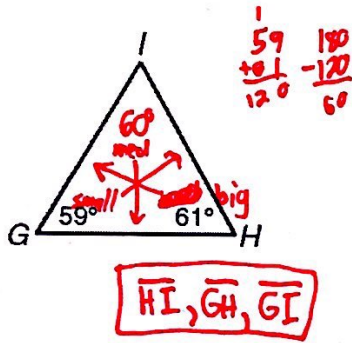
6. Name the angles in order from smallest to largest.

$2\frac{1}{8}$ big
F   D
2        $1\frac{1}{4}$ small
medium
E

$\angle F, \angle D, \angle E$
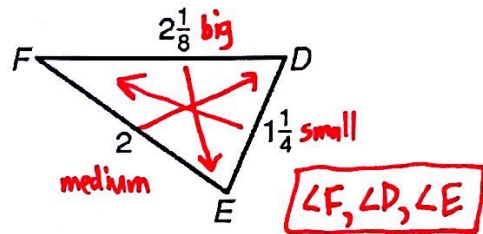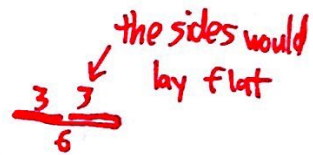
7. Can three segments with lengths 8, 15, and 6 make a triangle? Explain your answer.

No, because 8 + 6 = 14 and 14 is not greater than 15

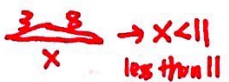8   6   can't reach
15
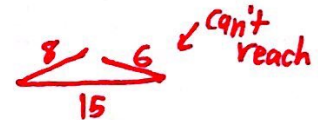
8. Can a triangle be made from the side lengths 3, 3, and 6? Explain.

No, 3 + 3 must be greater then 6, not equal to 6.

the sides would lay flat
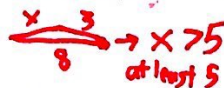3 3
6

9. A triangle has sides 3 cm and 8 cm. What are the possible side lengths of the third side?

If x is longest:
3   8   → x < 11
x   less than 11

If x is one of the shorter sides:
x   3 → x > 5
8   at least 5

$5 < x < 11$ cm

or

x > 5 and x < 11
cm   cm

10. What is a midsegment of a triangle?

The midsegment of a triangle is a segment that joins the midpoints of two of the sides.

Find the value of n.

2(n + 14) = 3n + 12
2n + 28 = 3n + 12
−2n   −2n
28 = n + 12
−12   −12
$16 = n$

3n + 12   n + 14

check
3·16 + 12 = 60
16 + 14 = 30
30·2 = 60 ✓

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