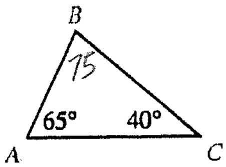
Geometry (H)
Section 6.4 - problems

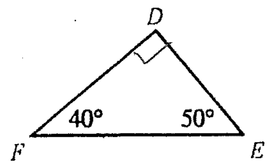
Name: KEY

List the sides of each figure from the shortest to the longest.

1.



2.



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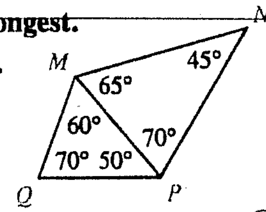


$MN > NP > MP > PQ > MQ$

$AB < BC < AC$ $\quad$ $DE < DF < EF$

List the sides of $\triangle ABC$ from the shortest to the longest.

4. $m\angle A = 46$, $m\angle B = 30$ $\quad$ **5.** $m\angle C = 101$, $m\angle B = 70$

6. $m\angle A = 59$, $m\angle C = 61$ $\quad$ **7.** $m\angle B = 48$, $m\angle A = 47$

(4) $AC < BC < AB$

(5) $BC < AC < AB$

(6) $BC < AC < AB$

(7) $BC < AC < AB$

List the angles of $\triangle ABC$ from the smallest to the largest.

8. $AB = 17$, $BC = 21$, $AC = 18$ $\quad$ **9.** $AB = 15$, $AC = 16$, $BC = 17$

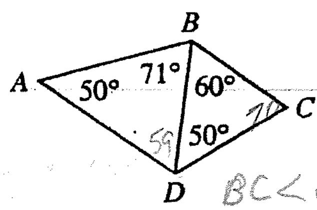
(8) $m\angle C < m\angle B < m\angle A$

(9) $m\angle C < m\angle B < m\angle A$

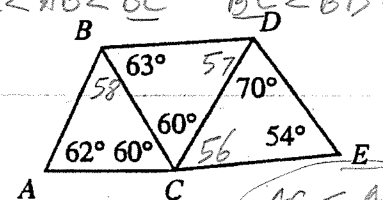
10. List the sides of quadrilateral $ABCD$ from the shortest to the longest.

11. List all the segments in the figure from the shortest to the longest.

$AC < AB < BC$ $\quad$ $BC < BD < CD$ $\quad$ $CD < DE < CE$



$BC < CD < BD < AB < AD$



$AC < AB < BC < BD < CD < DE < CE$

Which numbers could represent the lengths of the sides of a triangle?

12. ~~10, 20, 30~~ $\quad$ **13.** 10, 8, 6 $\quad$ **14.** ~~5, 14, 7~~

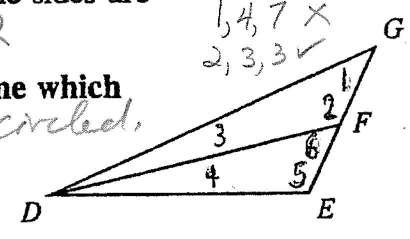
15. ~~4, 9, 15~~ $\quad$ **16.** 6, 6, 11 $\quad$ **17.** ~~1, 3, 5~~

18. If the sum of the lengths of two sides of a triangle is 15, what is the largest possible integral value for the third side? 14 $\quad$ 7, 8, 14

19. If the base of an isosceles triangle is 10, what is the shortest possible integral value for each of the equal sides? 6 $\quad$ $2x > 10$, $x > 5$ $\quad$ 6

20. If the perimeter of a triangle is 8 and the lengths of the sides are integers, what is the length of the shortest side? 2 $\quad$ 1, 4, 7 ✗ $\quad$ 2, 3, 3 ✓

Use the Exterior Angle Inequality Theorem to determine which angle is larger or state *not possible*. Larger ∡ is circled.



21. ∠1 and ∠6 $\quad$ **22.** ∠1 and ∠2 Not possible

23. ∠2 and ∠4 $\quad$ **24.** ∠5 and ∠2

* **26.** If the lengths of two sides of a triangle are 6 and p, where p is a whole number, give the possible whole numbers for the length of the third side.

$|6-p| < x < 6+p$

$6, \frac{1}{p}, \frac{6}{3^{rd}}$ $\quad$ 6, 4, 9 $\quad$ 6, 7, 12 $\quad$ 6, 11, 16

$6, \frac{2}{p}, \frac{7}{3^{rd}}$ $\quad$ 6, 5, 10 $\quad$ 6, 8, 13 $\quad$ 6, 12, 17

6, 6, 11 $\quad$ 6, 9, 14 $\quad$ 6, 13, 18 $\quad$ $|6-p|$

6, 3, 8 $\quad$ 6, 10, 15 $\quad$ $5 < x < 6+p$

Written Exercises

The lengths of two sides of a triangle are given. Write the numbers that best complete the statement: The length of the third side must be greater than _?_, but less than _?_.

1. 6, 9   **2.** 15, 13   **3.** 100, 100

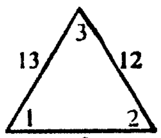
4. $7n$, $10n$ **5.** a, b (where $a > b$)   **6.** k, $k + 5$

① $3<x<15$ ② $2<x<28$ ③ $0<x<200$

④ $3n<x<17n$ ⑤ $|a-b|<x<a+b$ ⑥ $5<x<2k+5$

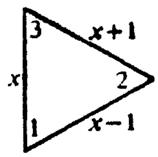
In Exercises 7–9 the diagrams are not drawn to scale. If each diagram were drawn to scale, which numbered angle would be the largest?

7.



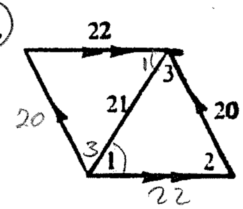
$m\angle 2$

8.



$\angle 1$

9.

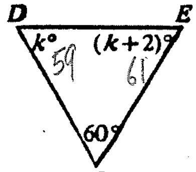


$\angle 3$

$\leftarrow \alpha \boxed{p}$

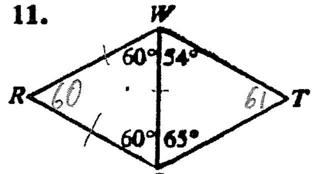
In Exercises 10–14 the diagrams are not drawn to scale. If each diagram were drawn to scale, which segment shown would be the longest?

10.



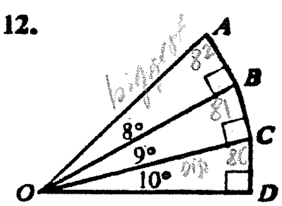
$\overline{DF}$

11.



$\overline{WT}$

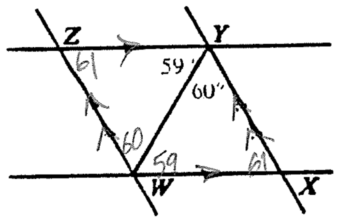
12.



$\overline{AO}$

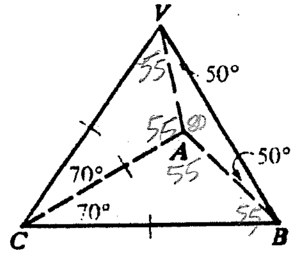
$AO > BO > CO > DO$

13.



$\overline{WY}$

14.

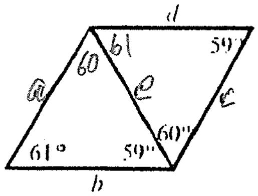


$\frac{110}{2} = 55$

$VA = AB$

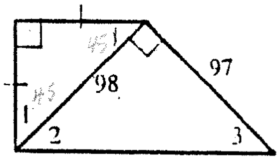
$\overline{VB}$

15. **Use the lengths a, b, c, d, and e to complete:**
$\underline{\ ?\ } > \underline{\ ?\ } > \underline{\ ?\ } > \underline{\ ?\ } > \underline{\ ?\ }$



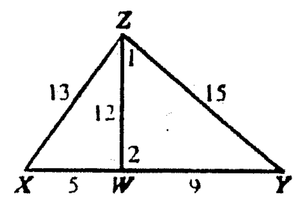
$c > d > e > b > a$

16. **Use $m\angle 1$, $m\angle 2$, and $m\angle 3$ to complete:**
$\underline{\ ?\ } > \underline{\ ?\ } > \underline{\ ?\ }$



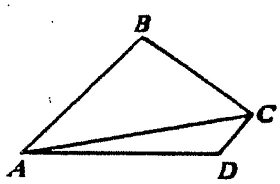
$\measuredangle 3 > \measuredangle 2 > \measuredangle 1$

17. **The diagram is not drawn to scale. Use $m\angle 1$, $m\angle 2$, $m\angle X$, $m\angle Y$, and $m\angle XZY$ to complete:**
$\underline{\ ?\ } > \underline{\ ?\ } > \underline{\ ?\ } > \underline{\ ?\ } > \underline{\ ?\ }$



$m\measuredangle 2 > m\measuredangle X > m\measuredangle XZY > m\measuredangle Y > m\measuredangle 1$

18. **Given: Quad. $ABCD$**
Prove: $AB + BC + CD + DA > 2(AC)$

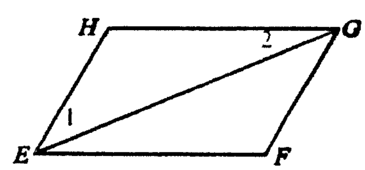


① $AB + BC > AC$
$AD + CD > AC$ → ② $AB + BC + AD + CD > 2(AC)$

① the sum of 2 sides of Δ > 3rd side.

② If $a > b$, and $c > d$, then $a + c > b + d$.

19. **Given: ▱$EFGH$; $EF > FG$**
Prove: $m\angle 1 > m\angle 2$



① ▱ $EFGH$ → ② $HG = EF$
$HE = GF$

③ $EF > FG$

→ ④ $HG > HE$

→ ⑤ $m\measuredangle 1 > m\measuredangle 2$

① Given
② ▱ → opp sides ≅
③ Given
④ Substitution
⑤ If one side of Δ > 2nd side, then $\measuredangle$ opp larger 2nd side