INEQUALITIES IN ONE TRIANGLE Assignment

Write the angles in order from smallest to largest.
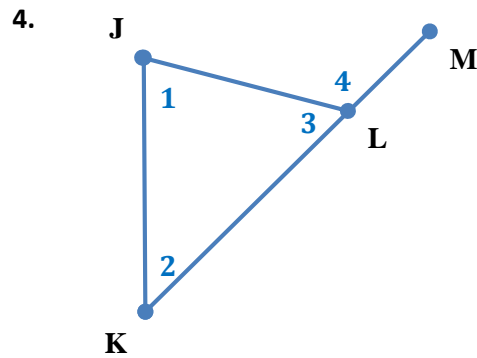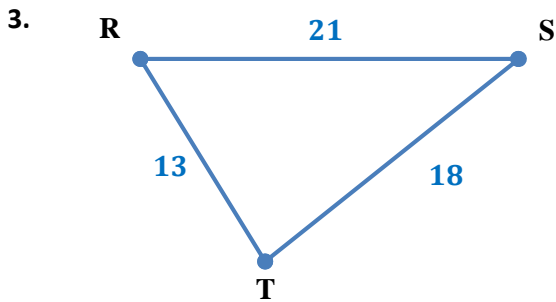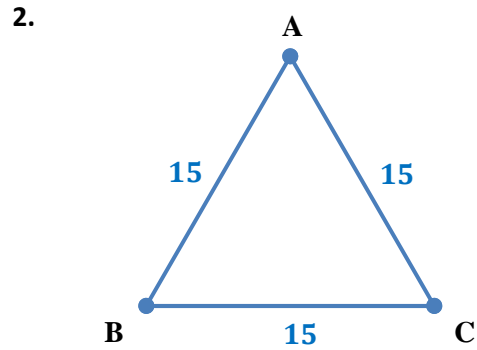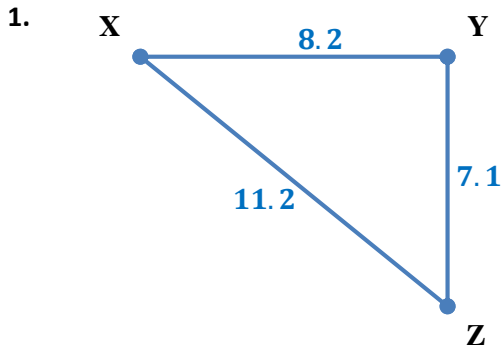
1.

X ——8.2—— Y

11.2

7.1

Z

2.

A

15   15

B ——15—— C

3.

R ——21—— S

13   18

T

4.

J

1   4

3   L

M

2

K

Write the sides in order from shortest to longest.

5.

X

72°

45°   63°

Y   Z

6.

P   Q

90°   24°

66°

R

7.

T

39°

101°   40°

U   V

8.

X   Y

40°   90°

50°

Z

INEQUALITIES IN ONE TRIANGLE Assignment

9.

A
59°

B
38°

83°
C
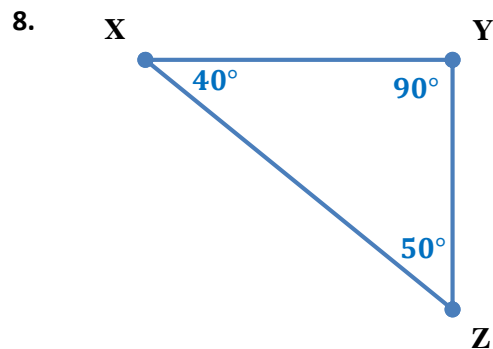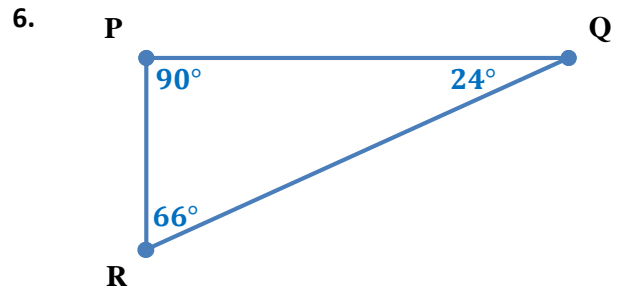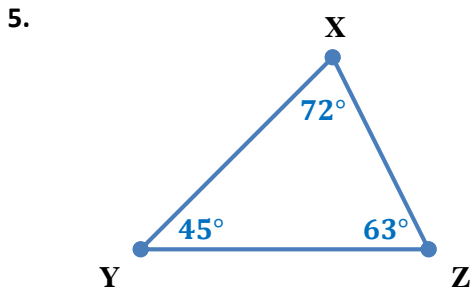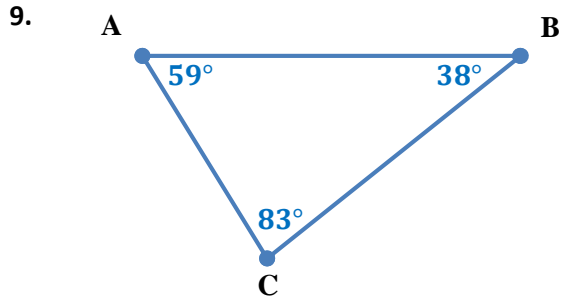
Determine whether a triangle can have sides with the given lengths.

10. 4, 7, 10

11. 3.5, 3.5, 6

12. 2, 9, 12

13. 3, 1.1, 1.7

14. 32, 11, 27

15. $7c + 6$, $10c - 7$, $3c^2$; when $c = 2$

The lengths of two sides of a triangle are given. Find the range of possible lengths for the third side.

16. **8mm**, **12 mm**

17. **3.5 ft**, **6.1 ft**

18. **16 ft**, **16 ft**

19. **3 ft**, **5 ft**

20. **12 cm**, **7 cm**

21. **9.2 cm**, **3.8 cm**

22. **4 yd**, **19 yd**

23. **3.07 m**, **1.89 m**

24. **28km**, **23 km**

25. **2.8 in**, **3.5 in**

26. **5 in**, **12 in**

27. **3 m**, **4 m**

28. **12 ft**, **18 ft**

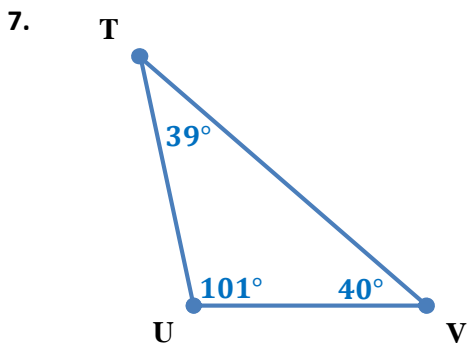29. **10 yd**, **23 yd**

30. **2 ft**, **4 ft**

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INEQUALITIES IN ONE TRIANGLE Assignment

ANSWER

Write the angles in order from smallest to largest.

1.

X — 8.2 — Y

11.2

7.1

Z

$$\overline{YZ} < \overline{XY} < \overline{XZ}$$

$$m\angle X < m\angle Z < m\angle Y$$

2.

A

15   15

B — 15 — C

$$\overline{AB} = \overline{BC} = \overline{AC}$$

$$m\angle A = m\angle B = m\angle C$$

3.

R — 21 — S

13   18

T

$$\overline{RT} < \overline{ST} < \overline{RS}$$

$$m\angle S < m\angle R < m\angle T$$

4.

J

1   4   M

3   L

2

K
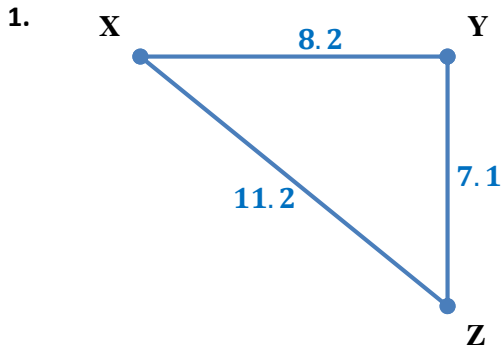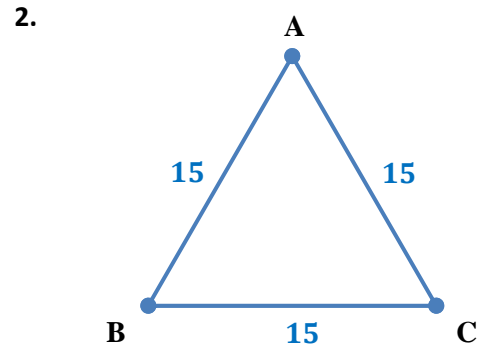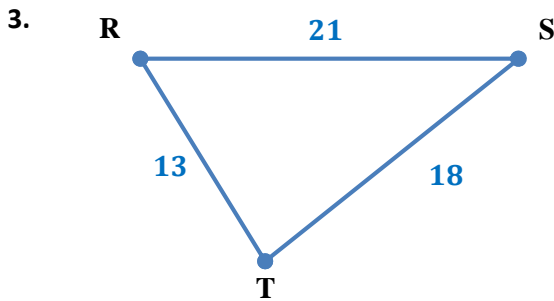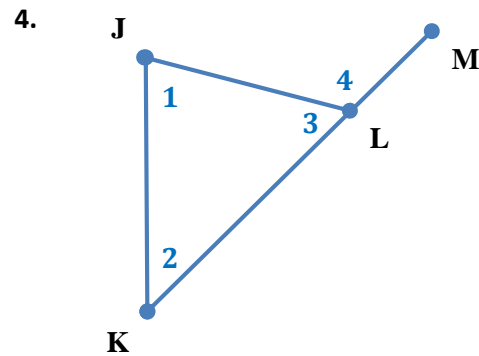
$$\overline{JL} < \overline{JK} < \overline{KL}$$

$$m\angle 2 < m\angle 3 < m\angle 1 < m\angle 4$$

Write the sides in order from shortest to longest.

5.

X

72°

45°   63°

Y   Z

$$m\angle Y < m\angle Z < m\angle X$$

$$\overline{XZ} < \overline{XY} < \overline{YZ}$$

6.

P   Q

90°   24°

66°

R
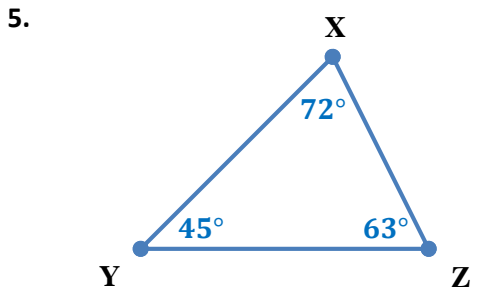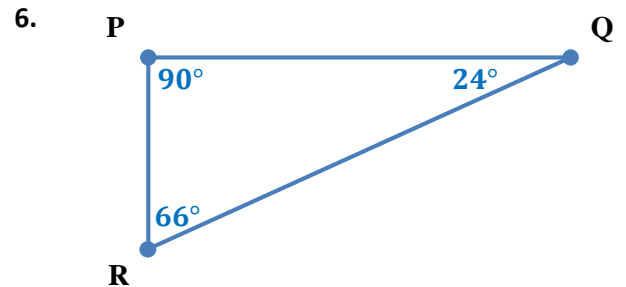
$$m\angle Q < m\angle R < m\angle P$$

$$\overline{PR} < \overline{PQ} < \overline{QR}$$

INEQUALITIES IN ONE TRIANGLE Assignment

7.

T

39°

101°   40°

U   V

$m\angle T < m\angle V < m\angle U$

$\overline{UV} < \overline{TU} < \overline{TV}$

8.

X   Y

40°   90°

50°

Z

$m\angle X < m\angle Z < m\angle Y$

$\overline{YZ} < \overline{XY} < \overline{XZ}$

9.

A   B

59°   38°

83°

C
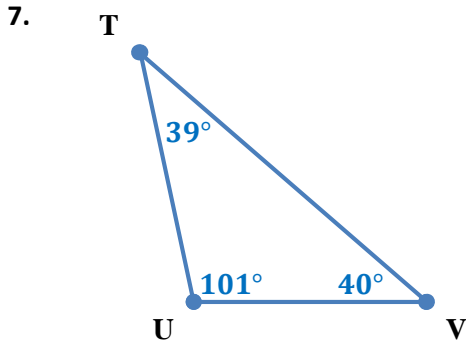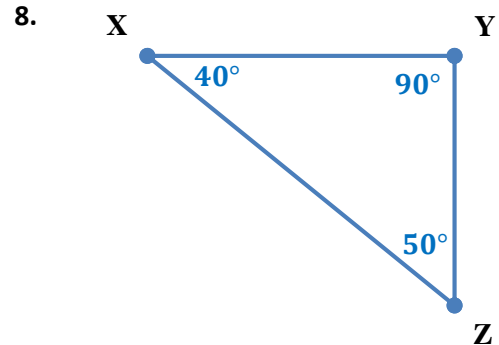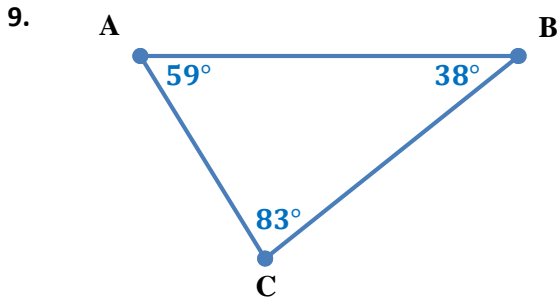
$m\angle B < m\angle A < m\angle C$

$\overline{AC} < \overline{BC} < \overline{AB}$

Determine whether a triangle can have sides with the given lengths.

10.   4,   7,   10

Triangle

$4 + 7 > 10$	$7 + 10 > 4$	$4 + 10 > 7$
$11 > 10$	$17 > 4$	$14 > 7$

11.   3.5,   3.5,   6

Triangle

$3.5 + 3.5 > 6$	$3.5 + 6 > 3.5$	$3.5 + 6 > 3.5$
$7 > 6$	$9.5 > 3.5$	$9.5 > 3.5$

12.   2,   9,   12

Not a triangle

$2 + 9 > 12$	$9 + 12 > 2$	$2 + 12 > 9$
$11 > 12$	$21 > 2$	$14 > 9$

13.   3,   1.1,   1.7

Not a triangle

$3 + 1.1 > 1.7$	$1.1 + 1.7 > 3$	$3 + 1.7 > 1.1$
$4.1 > 1.7$	$2.8 > 3$	$4.7 > 1.1$

14.   32,   11,   27

Triangle

$32 + 11 > 27$	$11 + 27 > 32$	$32 + 27 > 11$
$43 > 27$	$39 > 32$	$59 > 11$

15. $7c + 6$, $10c - 7$, $3c^2$; $when\ c = 2$

Triangle

$7c + 6$	$10c - 7$	$3c^2$
$= 7(2) + 6$	$= 10(2) - 7$	$= 3(2)^2$
$= 14 + 6$	$= 20 - 7$	$= 3(4)$
$= 20$	$= 13$	$= 12$

$20 + 13 > 12$	$13 + 12 > 20$	$20 + 12 > 13$
$33 > 12$	$25 > 20$	$32 > 13$

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INEQUALITIES IN ONE TRIANGLE Assignment

The lengths of two sides of a triangle are given. Find the range of possible lengths for the third side.

16. **8mm,   12 mm**
    4 mm < x < 20 mm

$8 + 12 > x$	$12 + x > 8$	$x + 8 > 12$
$20 > x$	$x > 8 - 12$	$x > 12 - 8$
	$x > -4$	$x > 4$

17. **3.5 ft,   6.1 ft**
    2.6 ft < x < 9.6 ft

$3.5 + 6.1 > x$	$6.1 + x > 3.5$	$x + 3.5 > 6.1$
$9.6 > x$	$x > 3.5 - 6.1$	$x > 6.1 - 3.5$
	$x > -2.6$	$x > 2.6$

18. **16 ft,   16 ft**
    0 ft < x < 32 ft

$16 + 16 > x$	$16 + x > 16$	$x + 16 > 16$
$32 > x$	$x > 16 - 16$	$x > 16 - 16$
	$x > 0$	$x > 0$

19. **3 ft,   5 ft**
    2 ft < x < 8 ft

$3 + 5 > x$	$5 + x > 3$	$x + 3 > 5$
$8 > x$	$x > 3 - 5$	$x > 5 - 3$
	$x > -2$	$x > 2$

20. **12 cm, 7 cm**
    5 cm < x < 19 cm

$12 + 7 > x$	$7 + x > 12$	$x + 12 > 7$
$19 > x$	$x > 12 - 7$	$x > 7 - 12$
	$x > 5$	$x > -5$

21. **9.2 cm,   3.8 cm**
    5.4 cm < x < 13 cm

$9.2 + 3.8 > x$	$3.8 + x > 9.2$	$x + 9.2 > 3.8$
$13 > x$	$x > 9.2 - 3.8$	$x > 3.8 - 9.2$
	$x > 5.4$	$x > -5.4$

22. **4 yd,   19 yd**
    15 yd < x < 23 yd

$4 + 19 > x$	$19 + x > 4$	$x + 4 > 19$
$23 > x$	$x > 4 - 19$	$x > 19 - 4$
	$x > -15$	$x > 15$

23. **3.07 m,   1.89 m**
    1.18 m < x < 4.96 m

$3.07 + 1.89 > x$	$1.89 + x > 3.07$	$x + 3.07 > 1.89$
$4.96 > x$	$x > 3.07 - 1.89$	$x > 1.89 - 3.07$
	$x > 1.18$	$x > -1.18$

24. **28km,   23 km**
    5 km < x < 51 km

$28 + 23 > x$	$23 + x > 28$	$x + 28 > 23$
$51 > x$	$x > 28 - 23$	$x > 23 - 28$
	$x > 5$	$x > -5$

25. **2.8 in,   3.5 in**
    0.7 in < x < 6.5 in

$2.8 + 3.5 > x$	$3.5 + x > 2.8$	$x + 2.8 > 3.5$
$6.5 > x$	$x > 2.8 - 3.5$	$x > 3.5 - 2.8$
	$x > -0.7$	$x > 0.7$

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INEQUALITIES IN ONE TRIANGLE Assignment

26. **5 *in*,   12 *in***

$7\ in < x < 17\ in$

$5 + 12 > x$ $12 + x > 5$ $x + 5 > 12$

$17 > x$ $x > 5 - 12$ $x > 12 - 5$

$x > -7$ $x > 7$

27. **3 *m*,   4 *m***

$1\ m < x < 7\ m$

$3 + 4 > x$ $4 + x > 3$ $x + 3 > 4$

$7 > x$ $x > 3 - 4$ $x > 4 - 3$

$x > -1$ $x > 1$

28. **12 *ft*,   18 *ft***

$6\ ft < x < 30\ ft$

$12 + 18 > x$ $18 + x > 12$ $x + 12 > 18$

$30 > x$ $x > 12 - 18$ $x > 18 - 12$

$x > -6$ $x > 6$

29. **10 *yd*,   23 *yd***

$13\ yd < x < 33\ yd$

$10 + 23 > x$ $23 + x > 10$ $x + 10 > 23$

$33 > x$ $x > 10 - 23$ $x > 23 - 10$

$x > -13$ $x > 13$

30. **2 *ft*,   4 *ft***

$2\ ft < x < 6\ ft$

$2 + 4 > x$ $4 + x > 2$ $x + 2 > 4$

$6 > x$ $x > 2 - 4$ $x > 4 - 2$

$x > -2$ $x > 2$