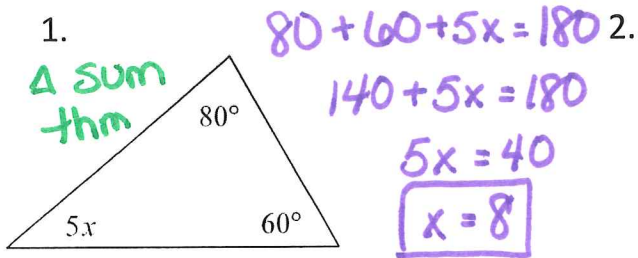
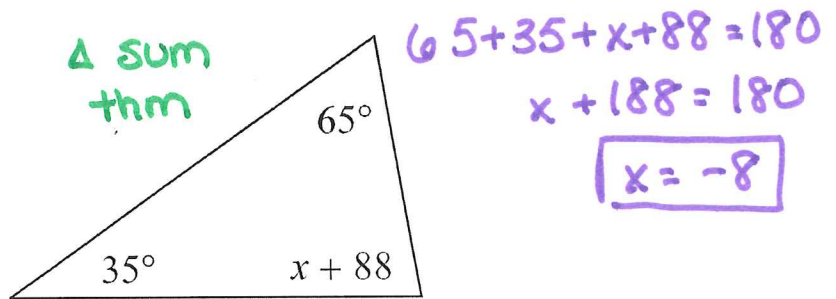


Triangle Review

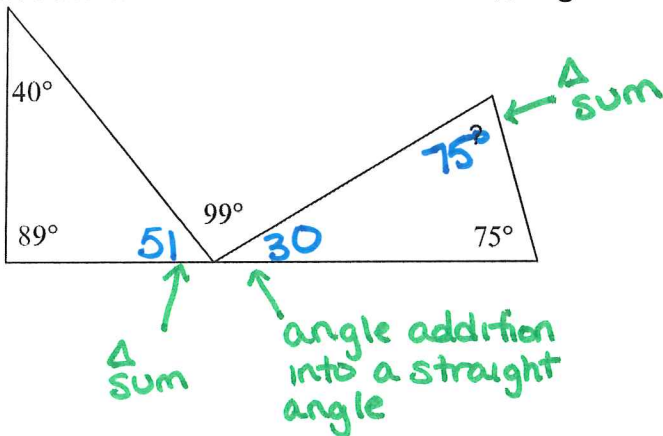
Show all work throughout the review to receive full credit!

Directions: Find x.

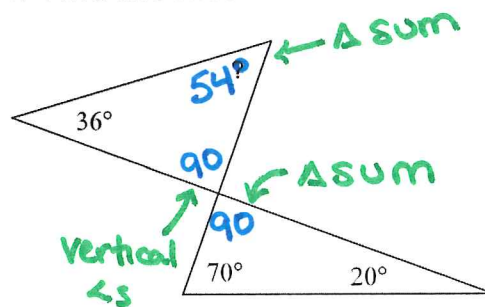
1. 

2. 

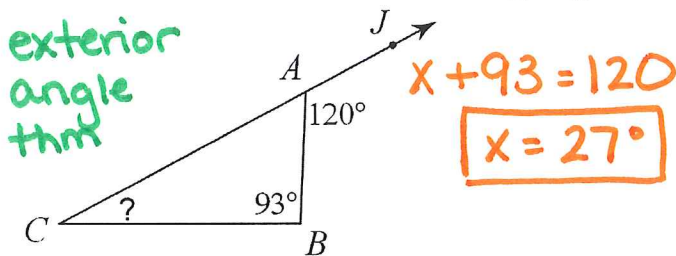
3. Find the measure of the missing angle.



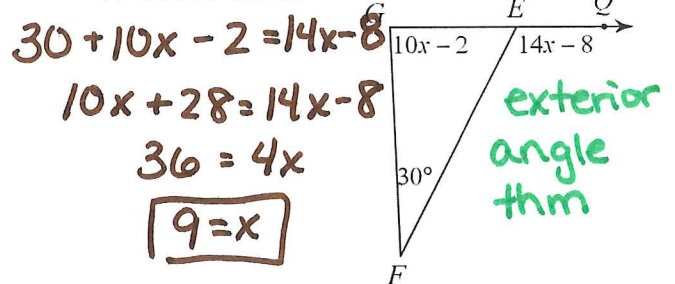
4. Find the measure of the missing angle.



5. Find the measure of the missing angle.



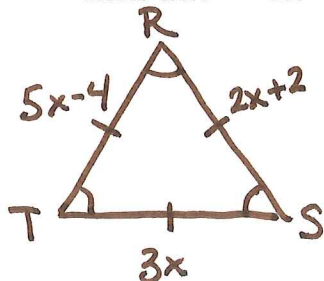
6. Solve for x.



Directions: For 7 and 8, draw, mark and label the figure, solve for the missing variable, and find the lengths of each side.

↑ when there is no figure, you MUST draw one

7. Find the measure of each side of equilateral $\triangle RST$ with $RS = 2x + 2$, $ST = 3x$, and $TR = 5x - 4$.



you can set any of the sides \cong since all 3 sides are \cong

$$RS = ST$$

$$2x + 2 = 3x$$

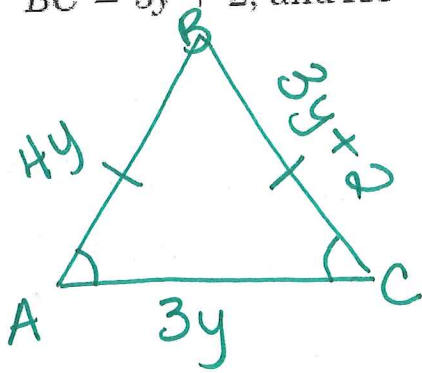
$$\boxed{2 = x}$$

$$RS = 2(2) + 2 = \boxed{6}$$

$$ST = 3(2) = \boxed{6}$$

$$TR = 5(2) - 4 = \boxed{6}$$

8. Find the measure of each side of isosceles $\triangle ABC$ with $AB = BC$ if $AB = 4y$, $BC = 3y + 2$, and $AC = 3y$.



$$AB = BC$$

$$4y = 3y + 2$$

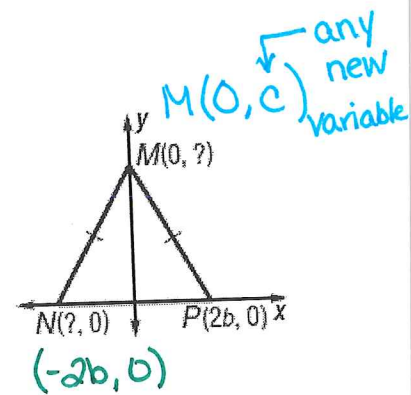
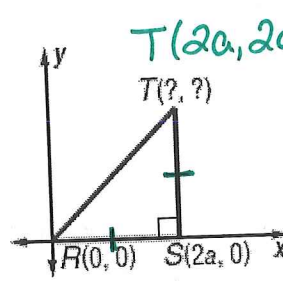
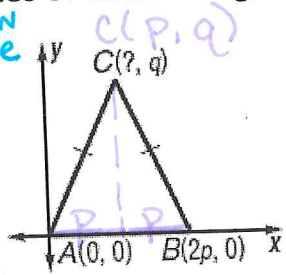
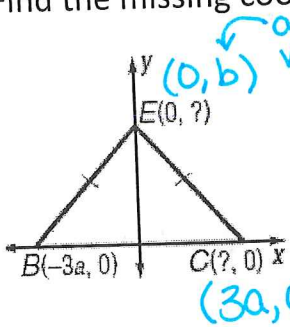
$$y = 2$$

$$AB = 8$$

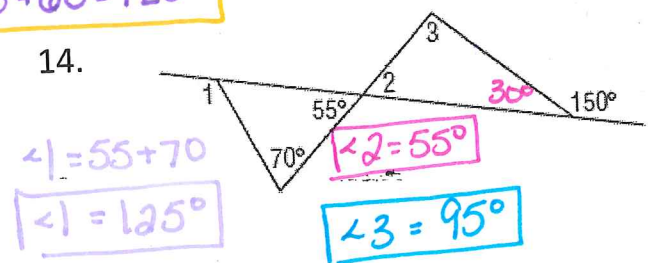
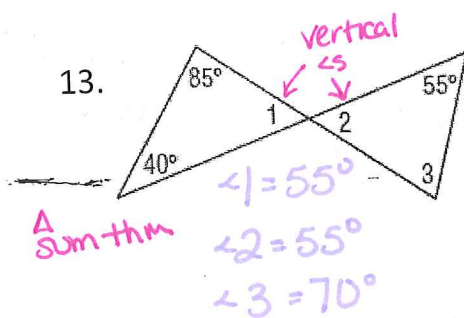
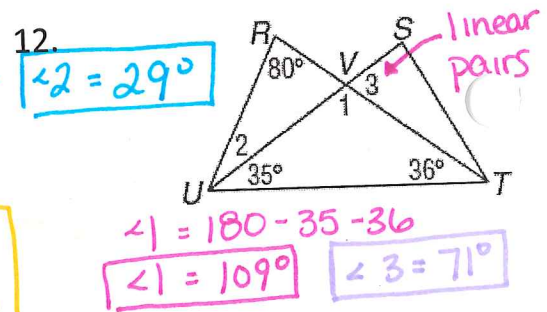
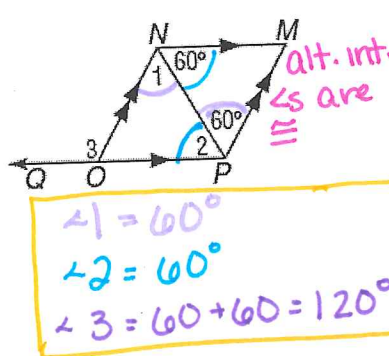
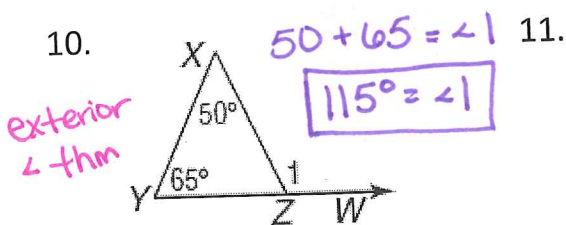
$$BC = 8$$

$$AC = 6$$

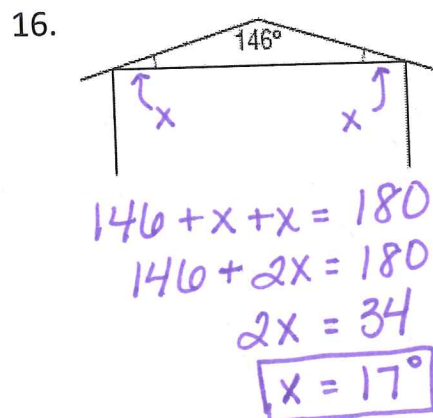
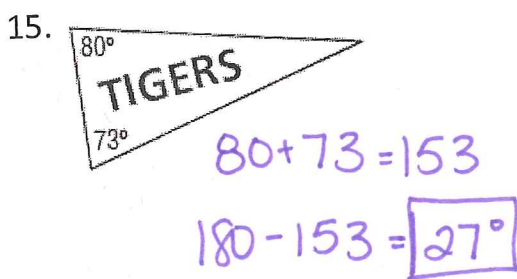
9. Find the missing coordinates of each triangle.



Find the measures of the numbered angles.

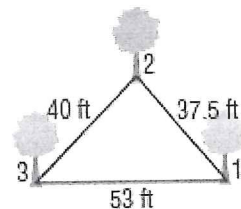


Find all missing angle measures.

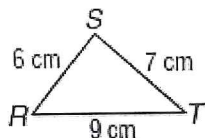


17. **SPORTS** The figure shows the position of three trees on one part of a Frisbee™ course. At which tree position is the angle between the trees the **greatest**?

Tree 2 (it is across from the greatest side)

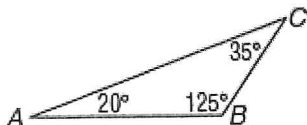


18. List the angles from **least to greatest**. (Hint: make sure you include your angle mark)



$\angle T, \angle R, \angle S$

19. List the side lengths from **greatest to least**. (Hint: to name a side, you name the two points that create the side)



AC, AB, CB

20. Do the following lengths form a triangle 4, 6, 16. Why or why not?

No because $4 + 6 = 10$ and $10 \neq 16$

21. Find the range for the measure of the third side given two sides of the triangle are 12 and 19.

$$7 < x < 31$$

$19 - 12$ $12 + 19$

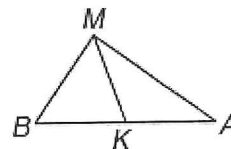
22. Given the following triangle with median MK state if the following statements are true or false.

a. $m \angle MKA = 90^\circ$ False

b. $BK \cong AK$ True

c. $m \angle BMK = m \angle AMK$ False

d. $\triangle BMA$ is isosceles with vertex angle M. False



23. Classify the triangle by its **sides and angles** given the two angle measure are 61° and 29° .

Find 3rd angle first: $180 - 61 - 29 = 90^\circ$

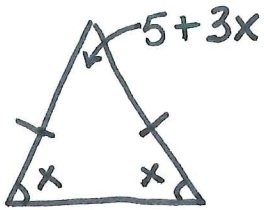
Right Scalene Triangle

24. Classify the triangle by its **sides and angles** given the two angle measure are 12° and 84° .

3rd angle: $180 - 12 - 84 = 84^\circ$

Acute Isosceles Triangle

25. If in an isosceles triangle, the vertex angle is 5 more than 3 times the measure of one of the base angles, find the measures of EVERY angle. Show all work and algebraic set up.



$$5 + 3x + x + x = 180$$

$$5x + 5 = 180$$

$$5x = 175$$

$$x = 35^\circ$$

The base angles are 35°
The vertex angle is 110° $3(35) + 5 = 110$

26. CONSTRUCTION The bottom end of a ramp at a warehouse is 10 feet from the base of the main dock and is 11 feet long. How high is the dock?

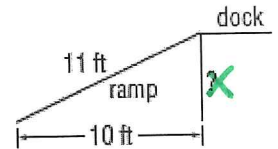
Pythagorean Thm (PT)

$$10^2 + x^2 = 11^2$$

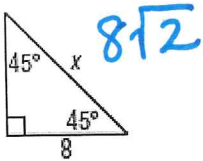
$$100 + x^2 = 121$$

$$\sqrt{x^2} = \sqrt{21}$$

$$x = \sqrt{21} \text{ ft}$$

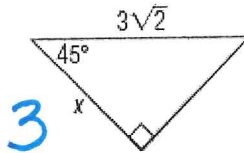


27. Find the value of x.



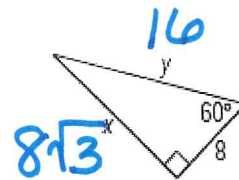
45-45-90

28. Find the value of x.



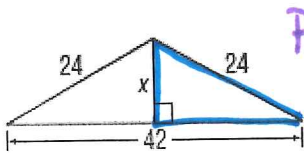
45-45-90

29. Find the value of x and y.



30-60-90

30. Find the value of x.

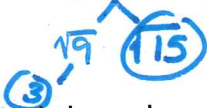


$$x^2 + 21^2 = 24^2$$

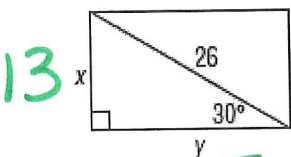
$$x^2 + 441 = 576$$

$$\sqrt{x^2} = \sqrt{135}$$

$$x = 3\sqrt{15}$$



33. Find the value of x and y.

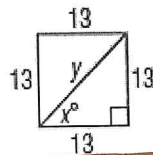


$$13$$

$$13\sqrt{3}$$

30-60-90

31. Find the value of x and y.

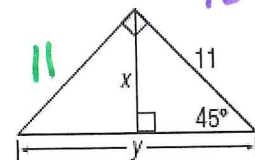


$$x = 45^\circ$$

$$y = 13\sqrt{2}$$

45-45-90

32. Find the value of x and y.

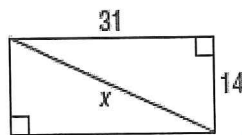


$$y = 11\sqrt{2}$$

$$x = \frac{11}{\sqrt{2}} = \frac{11}{2}\sqrt{2}$$

45-45-90

34. Find the value of x.



$$14^2 + 31^2 = x^2$$

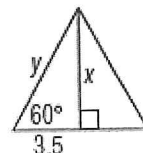
$$196 + 961 = x^2$$

$$\sqrt{1157} = x$$

$$x = \sqrt{1157}$$

PT

35. Find the value of x and y.

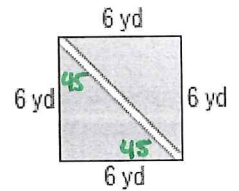


$$y = 7$$

$$x = 3.5\sqrt{3}$$

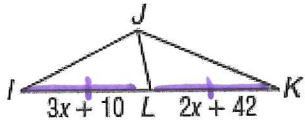
30-60-90

36. **BOTANICAL GARDENS** One of the displays at a botanical garden is an herb garden planted in the shape of a square. The square measures 6 yards on each side. Visitors can view the herbs from a diagonal pathway through the garden. How long is the pathway?



The pathway is $6\sqrt{2}$ yds long.

37. **MEDIAN** IF LJ is the median of $\triangle IJK$, find x.



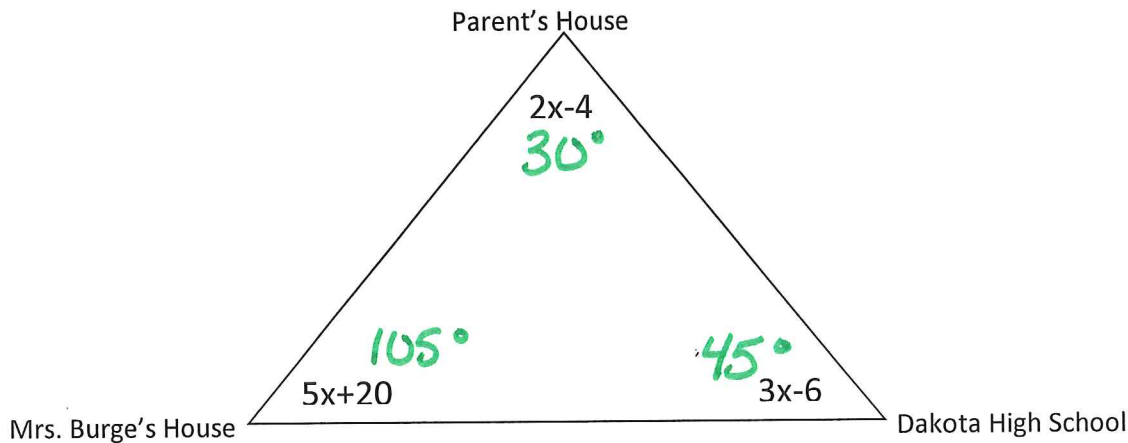
$$IL \cong LK$$

$$3x + 10 = 2x + 42$$

$$x + 10 = 42$$

$$x = 32$$

38. **ROUTE** Mrs. Burge's House, her Parent's House, and Dakota High school form a triangle on a map. What route would have the longest drive? (i.e. Which two buildings are farthest apart?)



$$2x - 4 + 5x + 20 + 3x - 6 = 180$$

$$10x + 10 = 180$$

$$10x = 170$$

$$x = 17$$

now plug it in...

$$2(17) - 4 = 30$$

$$5(17) + 20 = 105$$

$$3(17) - 6 = 45$$

The longest side is across from the largest angle.

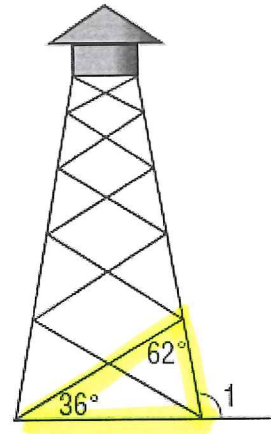
The longest drive is from her parents to Dakota.

39. **TOWERS** A lookout tower sits on a network of struts and posts. Leslie measured 2 angles on the tower, find the measure of $\angle 1$.

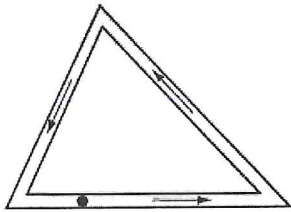
Exterior Angle Thm

$$\angle 1 = 36 + 62$$

$$\angle 1 = 98^\circ$$

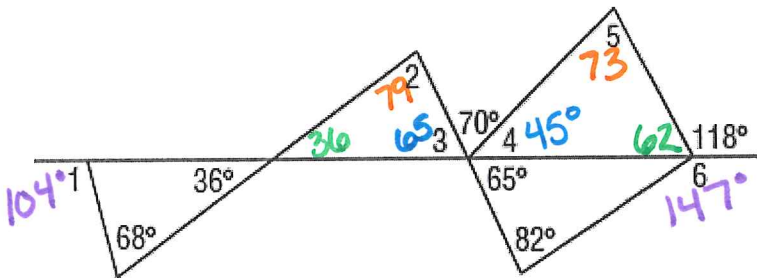


40. **PATHS** Rachel walks around a triangular path. At each corner, she records the measure of the angle she creates. She makes one complete circuit around the path. What is the sum of the three angle measure that she wrote down during one complete circuit?



The sum of 3 angles in a triangle is 180°

41. **CRAZY ANGLES!** Find the measures of the numbered angles.



$$\angle 1 = 104^\circ$$

$$\angle 4 = 45^\circ$$

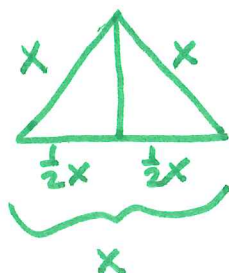
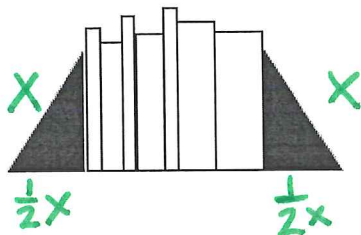
$$\angle 2 = 79^\circ$$

$$\angle 5 = 73^\circ$$

$$\angle 3 = 65^\circ$$

$$\angle 6 = 147^\circ$$

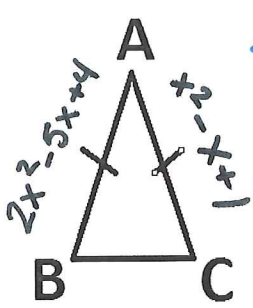
42. **BOOKENDS** Two bookends are shaped like right triangles. The bottom side of each triangle is exactly half as long as the slanted hypotenuse of the triangle. If all the book between the bookends are removed and they are pushed together, they will form a single triangle. Classify the triangle that will be formed as equilateral, isosceles or scalene.



Equilateral Triangle

43. Find the value(s) that would create an isosceles triangle with vertex at $\angle A$. Show all work!

a) $AB = 2x^2 - 5x + 4$ and $AC = x^2 - x + 1$



$$2x^2 - 5x + 4 = x^2 - x + 1$$

$$x^2 - 4x + 3 = 0$$

$$[-1] \cdot [-3] = 3$$

$$[-1] + [-3] = -4$$

$$(x-1)(x-3)$$

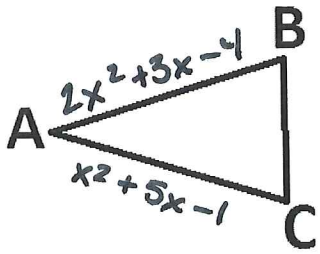
$$x=1 \quad x=3$$

$$2(1)^2 - 5(1) + 4 = 1 \quad 2(3)^2 - 5(3) + 4 = 7$$

$$1^2 - 1 + 1 = 1$$

$$3^2 - 3 + 1 = 7$$

c) $AB = 2x^2 + 3x - 4$ and $AC = x^2 + 5x - 1$



$$2x^2 + 3x - 4 = x^2 + 5x - 1$$

$$x^2 - 2x - 3 = 0$$

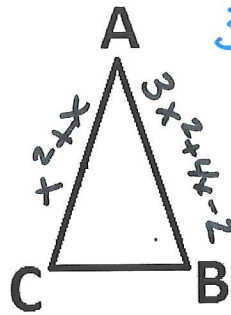
$$[-3] \cdot [1] = -3$$

$$[-3] + [1] = -2$$

$$(x-3)(x+1)$$

$$x=3 \quad x=-1$$

b) $AB = 3x^2 + 4x - 2$ and $AC = x^2 + x$



$$3x^2 + 4x - 2 = x^2 + x$$

$$2x^2 + 3x - 2 = 0$$

$$[-1] \cdot [4] = -4$$

$$[-1] + [4] = 3$$

$$(x-\frac{1}{2})(x+2) \Rightarrow (2x-1)(x+2)$$

$$x=\frac{1}{2} \quad x=-2$$

$$\frac{1}{2}^2 + \frac{1}{2} = 0.75$$

$$3(\frac{1}{2})^2 + 4(\frac{1}{2}) - 2 = 0.75$$

$$(-2)^2 + (-2) = 2$$

$$3(-2)^2 + 4(-2) - 2 = 2$$

$$2(3)^2 + 3(3) - 4 = 23$$

$$3^2 + 5(3) - 1 = 23$$

$$2(-1)^2 + 3(-1) - 4 = -5$$

$$(-1)^2 + 5(-1) - 1 = -5$$

Sides cannot be a negative length

44. Find the measures of the side of $\triangle KPL$ and classify the triangle by its sides.

$K(-4,3)$, $P(1,2)$, $L(-3,-2)$

$$KL: 5^2 + 1^2 = x^2$$

$$25 + 1 = x^2$$

$$\sqrt{26} = x$$

$$LP: 4^2 + 4^2 = x^2$$

$$16 + 16 = x^2$$

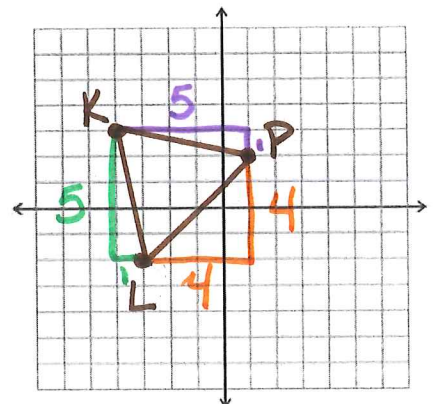
$$\sqrt{32} = x$$

$$4\sqrt{2} = x$$

$$KP: 5^2 + 1^2 = x^2$$

$$x = \sqrt{26}$$

It is an isosceles triangle b/c 2 sides are \cong



45. Find the measures of the side of $\triangle ABC$ and classify the triangle by its sides.

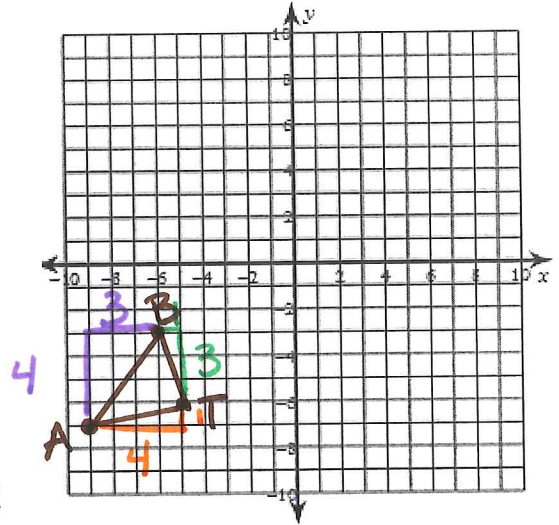
$A(-9, -7), B(-6, -3), T(-5, -6)$

$$\begin{aligned} AB: 4^2 + 3^2 &= x^2 \\ 16 + 9 &= x^2 \\ \sqrt{25} &= x \\ \boxed{5} &= x \end{aligned}$$

$$\begin{aligned} BT: 1^2 + 3^2 &= x^2 \\ 1 + 9 &= x^2 \\ \boxed{\sqrt{10}} &= x \end{aligned}$$

$$\begin{aligned} AT: 4^2 + 1^2 &= x^2 \\ 16 + 1 &= x^2 \\ \boxed{\sqrt{17}} &= x \end{aligned}$$

This is a scalene triangle b/c all 3 sides are different lengths



46. Find the measures of the side of $\triangle RST$ and classify the triangle by its sides.

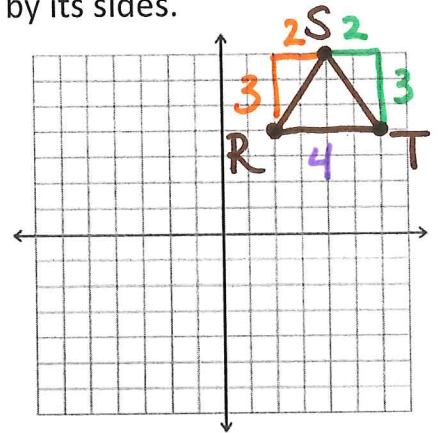
$R(2,4), S(4,7), T(6,4)$

$$\begin{aligned} SR: 2^2 + 3^2 &= x^2 \\ 4 + 9 &= x^2 \\ \boxed{\sqrt{13}} &= x \end{aligned}$$

$$\begin{aligned} ST: 2^2 + 3^2 &= x^2 \\ 4 + 9 &= x^2 \\ \boxed{\sqrt{13}} &= x \end{aligned}$$

$RT = 4$ by counting

$$\begin{aligned} \overline{OR} \quad RT: 4^2 + 0^2 &= x^2 \\ 16 + 0 &= x^2 \\ \sqrt{16} &= x \\ \boxed{4} &= x \end{aligned}$$



This is an isosceles triangle b/c there are 2 \cong sides.