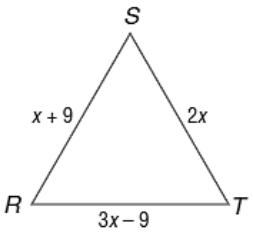
Name: _____ HOUR: _____Due Date: _____

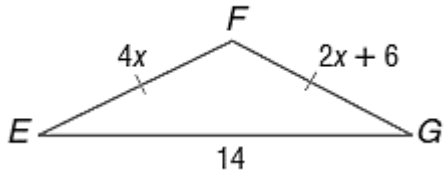
2016-2017 ACC Geometry Midterm Review

Directions: This review consists of problems that could be on your midterm. Make sure you complete each problem and **show your work.**

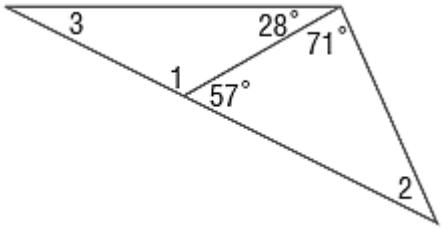
1. For equilateral ΔRST, find the variable and the side lengths. All units are in inches.



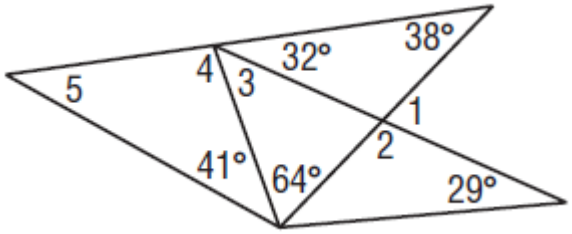
2. For isosceles ΔRST, find the variable and the side lengths. All units are in centimeters.



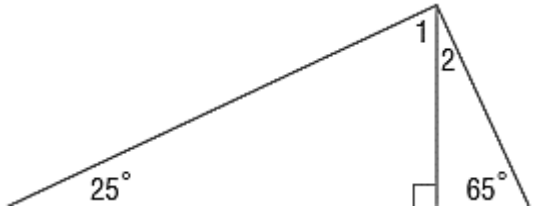
3. Find the missing angle measures, $m\angle 1$ and $m\angle 2$.



4. Find the missing angle measures.

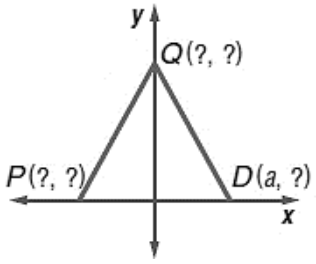


5. Find the missing angle measures.

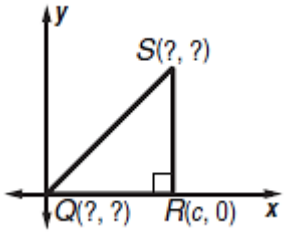


6. Do any of the following sets of numbers create a triangle?
   a. 7, 20, 10
   b. 7, 9, 12
   c. 16, 10, 9
   d. $\sqrt{13}$, 6, 6
   e. 7, 18, 11

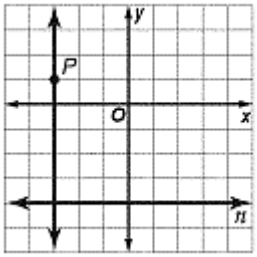
7. What are the missing coordinates of the triangle?



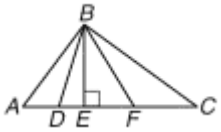
8. What are the missing coordinates of this isosceles right triangle?



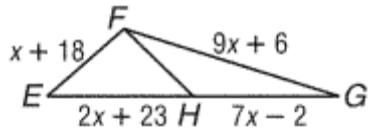
9. What is the shortest distance from P to line n?



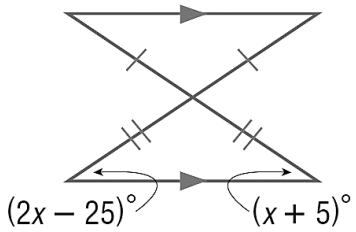
10. What is the shortest distance from point B to segment AC?



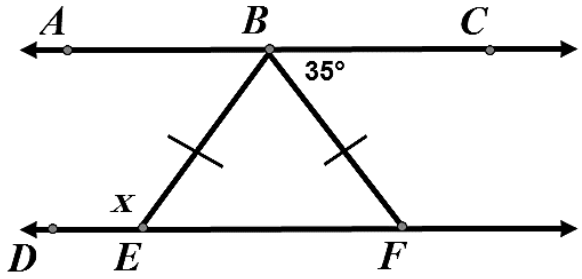
11. If FH is a median of ΔEFG, find the perimeter of ΔEFG.



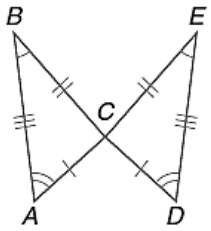
12. Find x.



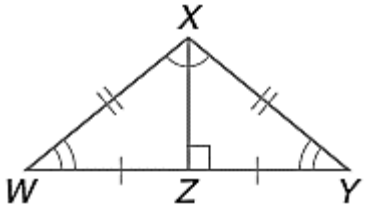
13. In the figure below, B is on $\overline{AC}$, E is on $\overline{DF}$, $\overline{AC}$ is parallel to $\overline{DF}$, and $\overline{BE}$ is congruent to $\overline{BF}$.. Name the legs of the isosceles triangle, name the base angles and vertex angle of the isosceles triangle, and provide an example of an exterior angle. What is the measure of <DEB and <EBF?



14. Identify the triangle ΔCAB is congruent to, then name all corresponding parts. There should be 6 pairs.



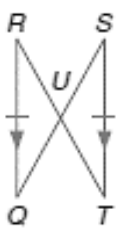
15. Identify the triangle ΔXZW is congruent to, then name all corresponding parts. There should be 6 pairs.



16. Write a two-column proof.

Given: $\overline{RQ} \cong \overline{ST}$ and $\overline{RQ} \parallel \overline{ST}$

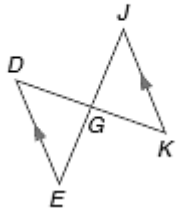
Prove: $\triangle RUQ \cong \triangle TUS$



17. Write a two-column proof.

Given: $\overline{DE} \parallel \overline{JK}$, $\overline{DK}$ bisects $\overline{JE}$.

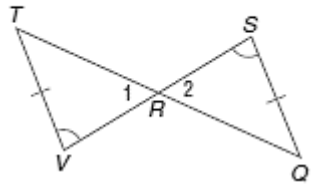
Prove: $\triangle EGD \cong \triangle JGK$



18. Write a two-column proof.

Given: $\angle V \cong \angle S$, $\overline{TV} \cong \overline{QS}$

Prove: $\overline{VR} \cong \overline{SR}$



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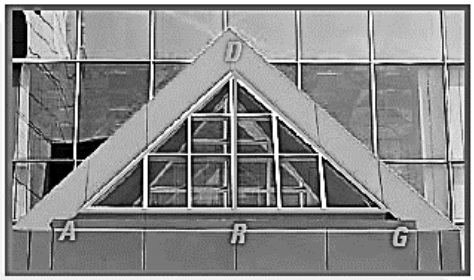
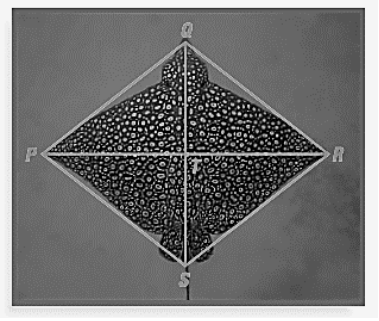
19. **ARCHITECTURE** You are designing the window shown in the photo. You want to make $\triangle DRA$ congruent to $\triangle DRG$. You design the window so that $\overline{DR} \perp \overline{AG}$ and $\overline{RA} \cong \overline{RG}$. Can you conclude that $\triangle DRA \cong \triangle DRG$?



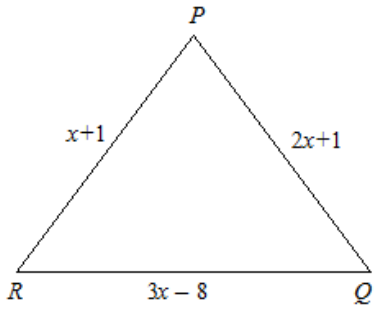
20. Write a two column proof using the stingray below.

GIVEN ▶ $\overline{QS} \perp \overline{RP}$, $\overline{PT} \cong \overline{RT}$

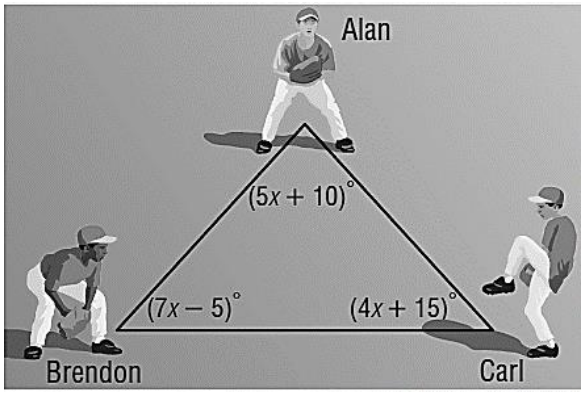
PROVE ▶ $\overline{PS} \cong \overline{RS}$



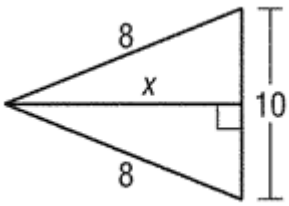
21. Find x, PQ, QR, and RP if $\triangle PQR$ is an isosceles triangle with $\overline{PQ} \cong \overline{QR}$.



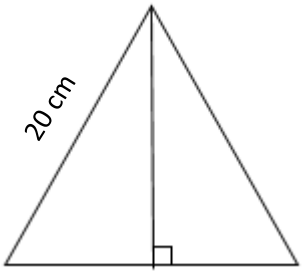
22. **BASEBALL** Alan, Brendon, and Carl were standing in a triangular formation shown. They were throwing the baseball to warm up for the game. Find the value of x, the measure of each angle and then conclude what two people must throw the farthest distance.



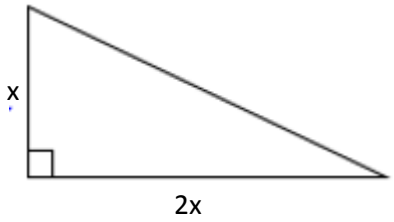
23. Find x.



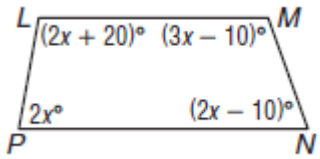
24. Find the altitude of an equilateral triangle whose sides are 20 cm long.



25. Find the hypotenuse of a right triangle where one leg is twice the other leg.



26. Find x, the interior sum, exterior sum, and <M.



Interior Angle Sum = _____

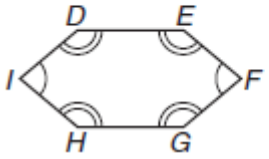
Exterior Angle Sum = _____

x = _____

<M = _____

27. Find x, the interior sum, exterior sum, and <G.

hexagon $DEFGHI$ with
$\angle D \cong \angle E \cong \angle G \cong \angle H, \angle F \cong \angle I,$
$m\angle D = 7x, m\angle F = 4x$



Interior Angle Sum = _____

Exterior Angle Sum = _____

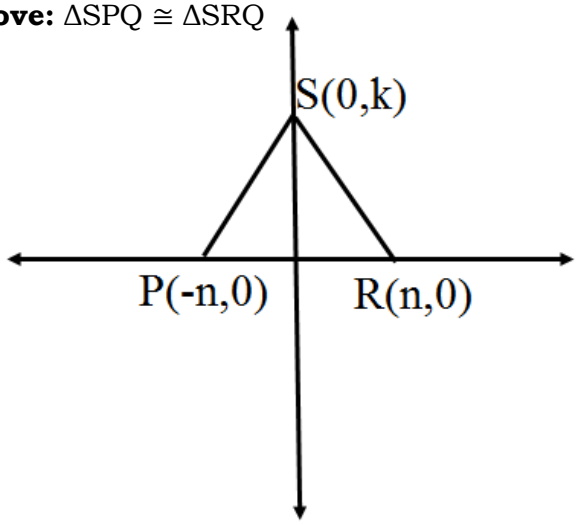
x = _____

<G = _____

28. Write a coordinate proof.

Given: Coordinates of vertices of ΔSPQ and ΔSRQ.

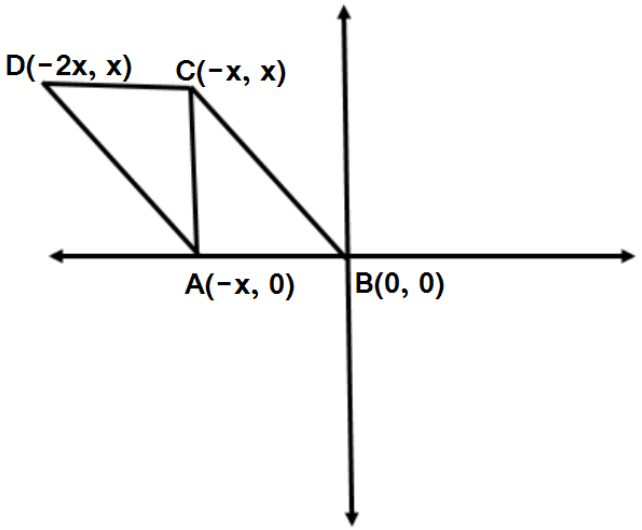
Prove: ΔSPQ ≅ ΔSRQ



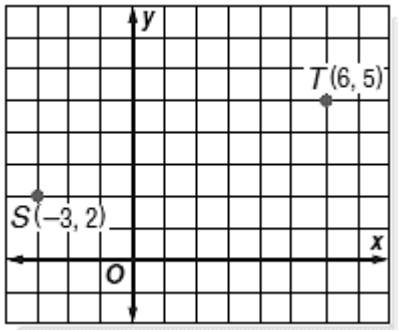
29. Write a coordinate proof.

Given: Coordinates of vertices of ΔACD and ΔCAB.

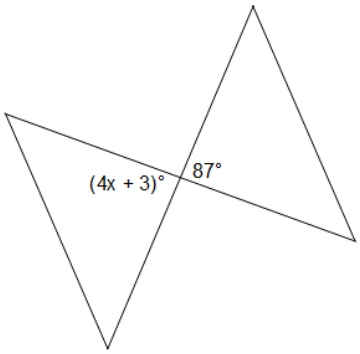
Prove: ΔACD ≅ ΔCAB



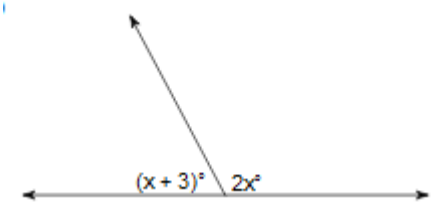
30. A. Find the distance between points S and T.
    B. If T is the midpoint of SR, find the endpoint R.



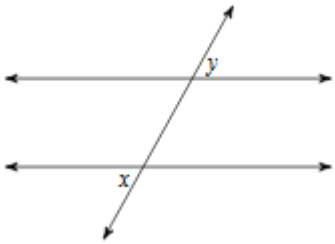
31. Find the value of x.

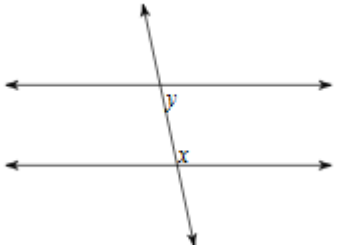


32. What is the degree measure of the larger of the two angles?

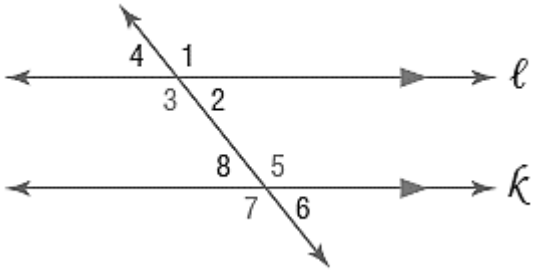


33. Name the relationships.

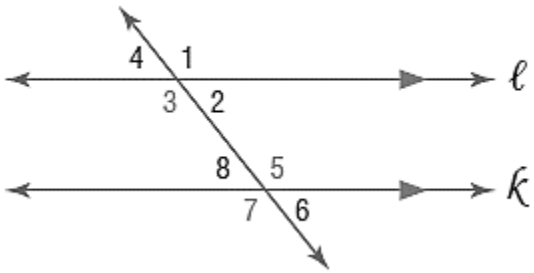




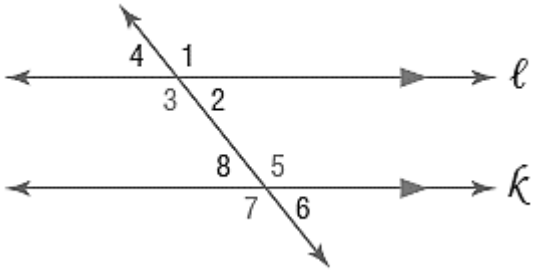
34. Find x so that lines l and k are parallel, given $< 2 = 27x + 2$ and $< 5 = 18x - 2$.



35. Find x so that lines l and k are parallel, given $< 4 = 17x$ and $< 6 = -5 + 18x$.



36. Name all the relationships that allow us to say l is parallel to k.



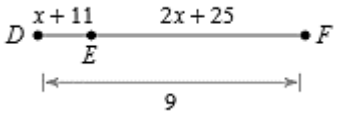
$< 1 \cong < 7$ proves $l||k$ because _____

$< 2 \cong < 8$ proves $l||k$ because _____

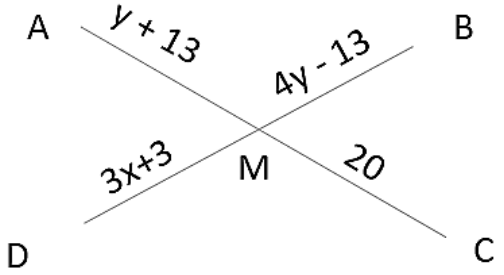
$< 3 \cong < 7$ proves $l||k$ because _____

$< 3 + < 8 = 180$ proves $l||k$ because _____

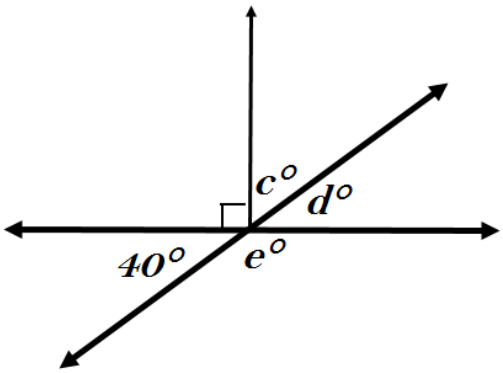
37. Find x, then the length of EF. Show your work, geometry and justify your set up!



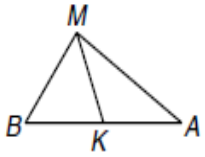
38. Point M is the segment bisector of lines AC and BD. Find x, y, and BM. Show your work, geometry and justify your set up!



39. Find all the missing angle measures. Then find the value of 2d – 3(e – c).



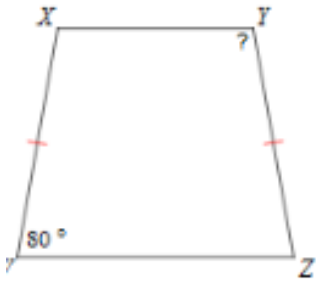
40. Given the following triangle with angle bisector MK state if the following statements are true or false.



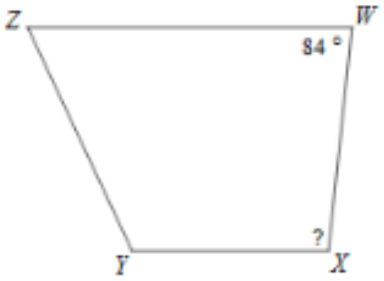
a. $m < MKA = 90^{o}$
b. $BK \cong AK$
c. $m < BMK = m < AMK$
d. ΔBMA is isosceles with vertex angle M.

41. Find the missing angle in the following trapezoids.

a.

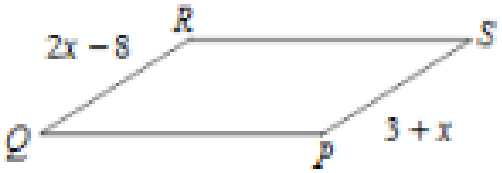


b.

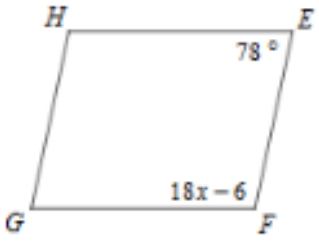


42. Given that the following are parallelograms, find x.

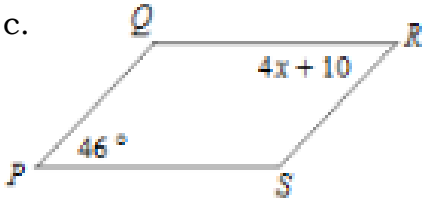
a.



b.



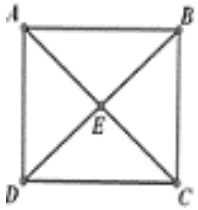
c.



43. Find x for the following quadrilaterals:

a. Suppose VWXY is a rectangle and XV= 4x - 9 and WY = x + 3

b. Suppose ABCD is a square and AC = 9y – 8 and BD = 7y +8

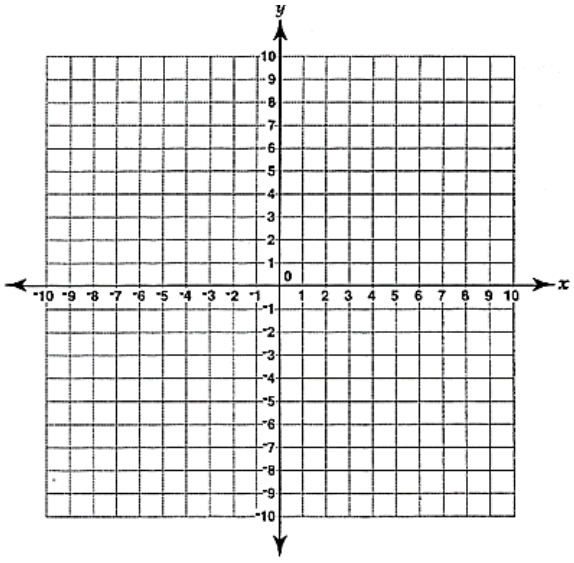


44. a. $ABCD$ is a rectangle with $B(5,-3), C(5,-6)$, and $D(9,-3)$. Find the coordinates of A.

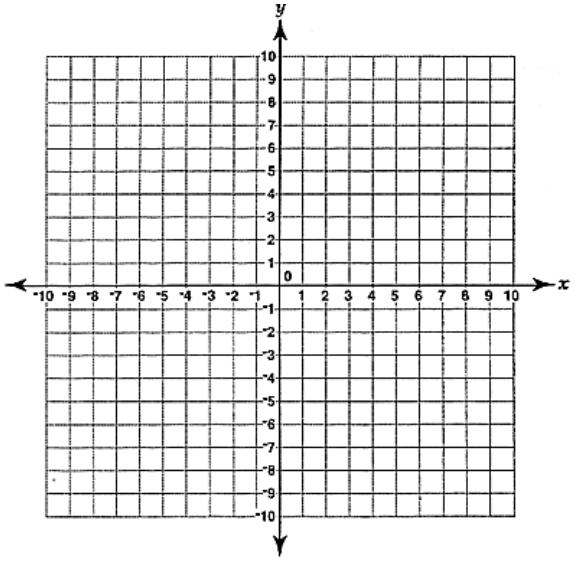
b. $ABCD$ is a rectangle with $B(10,7), C(10,4)$, and $D(8,4)$. Find the coordinates of A.

45. Given the set of vertices, choose all that apply: Quadrilateral, Parallelogram, Rectangle, Rhombus, and/or Square.

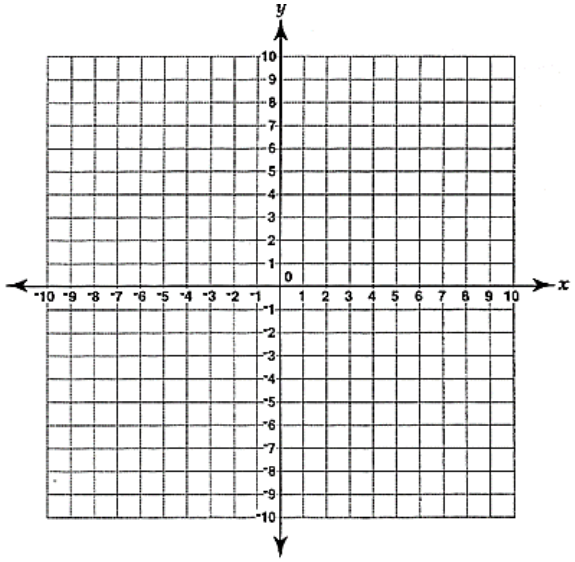
a. $A(-1,-5), B(-3,0), C(2,2), D(4,-3)$



b. $B(-9,1), E(2,3), F(12,-2), G(1,-4)$



c. $B(1, 3), E(7, -3), F(1, -9), G(-5, -3)$



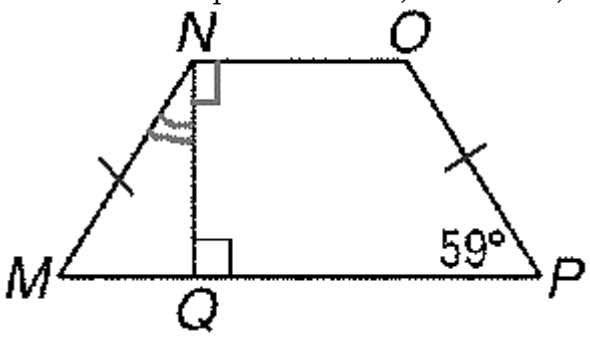
46. a. In a heptagon, one interior angle measures 35 degrees. What is the total measure of the other 6 interior angles?

b. In a nonagon, one interior angle measures 120 degrees. What is the total measure of the other 8 interior angles?

47. a. Given an isosceles trapezoid with height 3m and bases 18m and 26m. Find the perimeter, in meters.

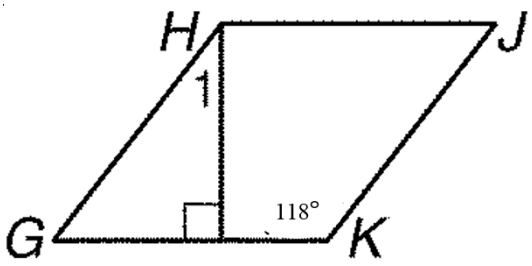
b. Given an isosceles trapezoid with height 8 m and bases 13 m and 25 m. Find the perimeter, in meters.

48. For isosceles trapezoid *MNOP*, find m<M, m<MNO and *m<MNQ*.

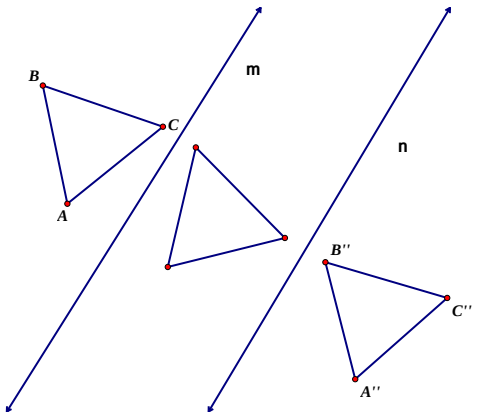


m<M= _____ m<MNO= _____ m<MNQ= _____

49. Find m< 1 if m<K=118.



50. If $m||n$ and triangle ABC is reflected over line m first, then line n, what transformation would occur from ΔABC to ΔA"B"C"?



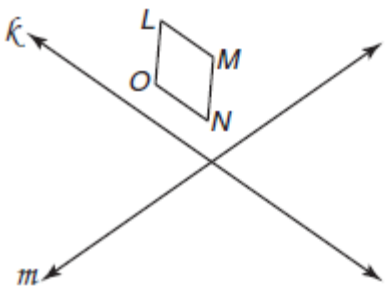
a. reflection

b. dilation

c. rotation

d. translation

51. If LMNO is reflected over line k first, then line m, what transformation would occur from LMNO to L"M"N"O"?



a. reflection

b. dilation

c. rotation

d. translation

52. Given point A(6, -1), find its image if it is reflected across the y-axis.
    a. (-6, -1) b. (6, -1)
    c. (-6, 1) d. (-1, 6)

53. Given the point (x, y), write the image point if it is reflected across the x-axis.

54. What is the image of Y(-7, 4) under the translation $(x,y) \rightarrow (x + 5, y)$?

55. What is the pre-image of X'(2, 5) under the translation $(x,y) \rightarrow (x - 1, y + 2)$?

56. Find the reflection of the point A(6, -1) across the line $y = x$.

57. Symmetry: How many lines of symmetry does a(n) ….

    a. Square have? _____

    b. Rectangle have? _____

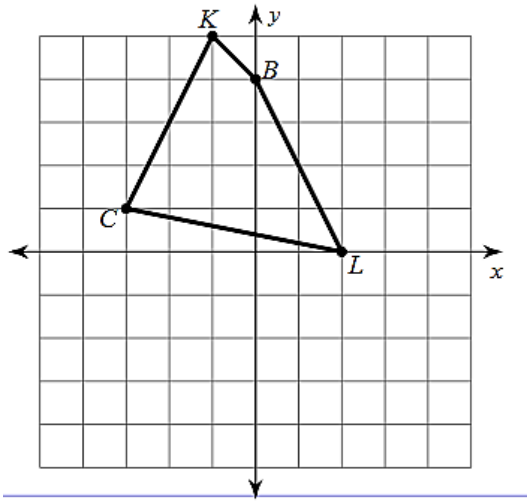
    c. Isosceles Trapezoid have? _____

    d. Isosceles Triangle have? _____

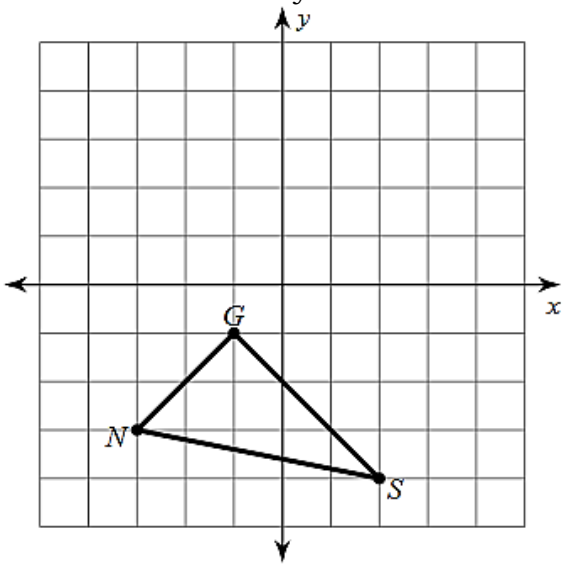
    e. Equilateral Triangle have? _____

    f. Pentagon have? _____

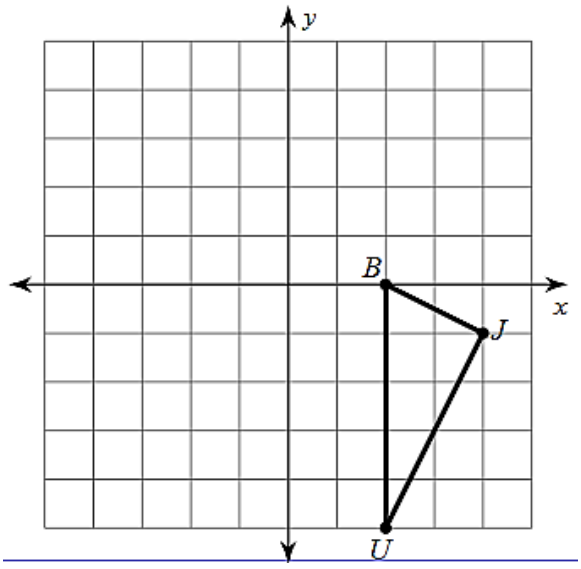
58. Graph the image of the figure with a reflection across y = 2



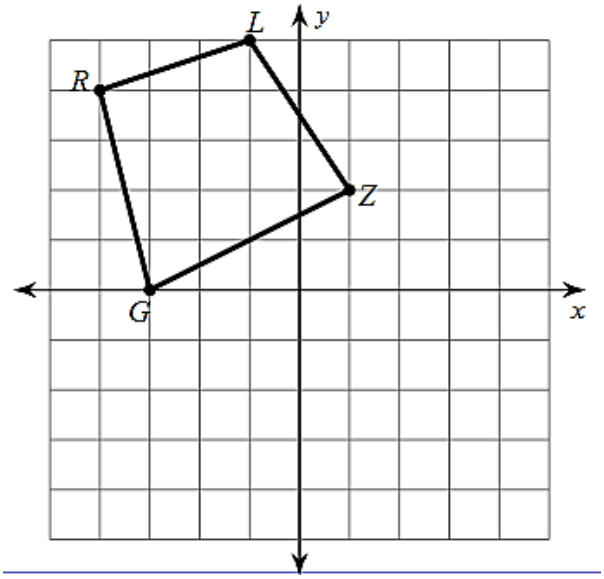
59. Graph the image of the figure with a reflection across y = x



60. Graph the image of the figure with a rotation 90° counterclockwise about the origin.

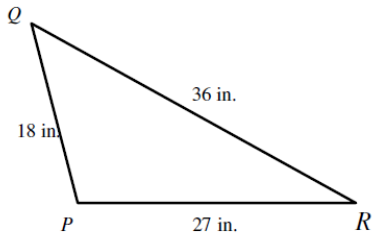


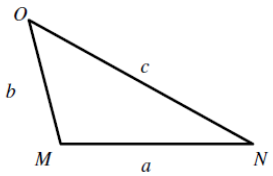
61. Graph the image of the figure with a rotation 90° clockwise about the origin.



62. $\Delta QPR \sim \Delta OMN$

Find a, b, and c if the perimeter of ΔMON is 63 inches. All measurements are in inches.





63. At a certain time of day, a 6 ft man casts a 4 ft shadow. At the same time of day, how tall is a tree that casts an 18 ft shadow?

64. If a 5 ft 10 in. person casts a 7 ft 4 in. shadow, how tall is a person who, at the same time, casts a 6 ft 8 in. shadow? Give your answer to the nearest inch.

65. Private eye Samantha Diamond places a mirror on the ground between herself and an apartment building and stands so that when she looks into the mirror, she sees into a window. The mirror's crosshairs are 1.22 meters from her feet and 7.32 meters from the base of the building. Sam's eye is 1.82 meters above the ground. How high is the window?

Directions: Solve each problem and show a diagram with each question which accurately labeled measurements.

66. At a specific time of day, a flag pole has a shadow 8ft 4in long, at the same time of day Jose who is only 4ft 6in tall has a shadow of 3ft 4in long. Find the height of the flagpole. Please leave final answer as an exact value, no rounding!

The flagpole is: _____ft _____in

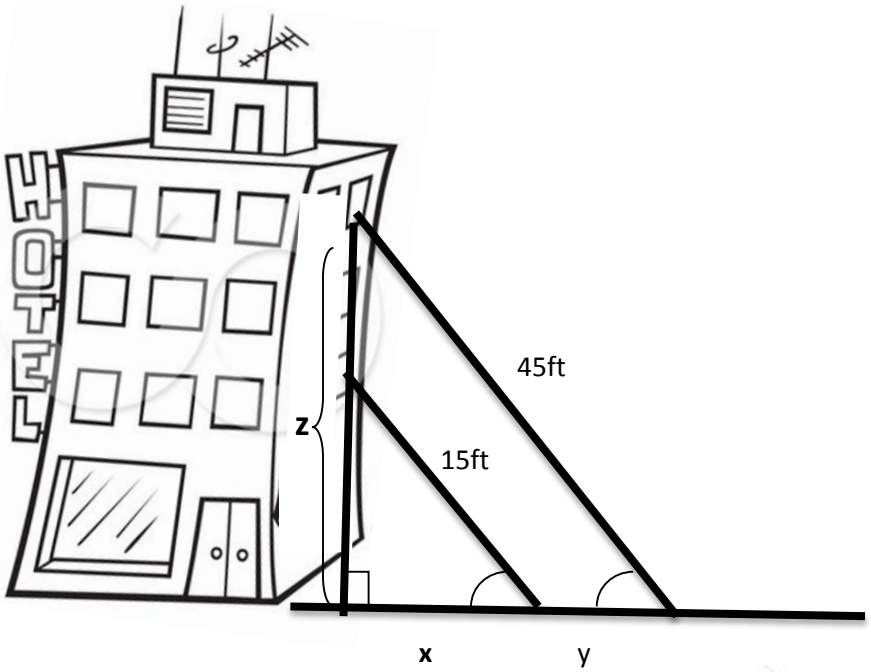
67. Nicole wants to find out the height of her favorite pine tree so that she can fit it in her house for Christmas. She stands within the tree's shadow and walks until her shadow meets the trees shadow. Nicole is 152.4cm tall. Her feet are 91.44cm from the base of the tree. She also knows that the tree has a shadow of 274.32cm long at this time of day. Help Nicole find the height of her favorite tree. If she can fit a 250cm tree in her living room, will this tree fit for the holidays? Explain. Please leave final answer in cm and round to the nearest hundredth.

Height of tree: _____

Can she use the tree for Christmas? _____

Explain…..

68. The local fire academy is practicing evacuating a hotel. Two teams are going through two windows. Window one, 12 feet above the ground and the other "z" ft above the ground. They are using a 15ft ladder to get to the lower window and a 45ft ladder to get to the higher window. Find z, the distance between the short ladder and the building (x), the distance between the two ladders (y) and the distance between the two windows with the ladders. Keep answer in feet and round to the nearest tenth <u>if needed</u>.

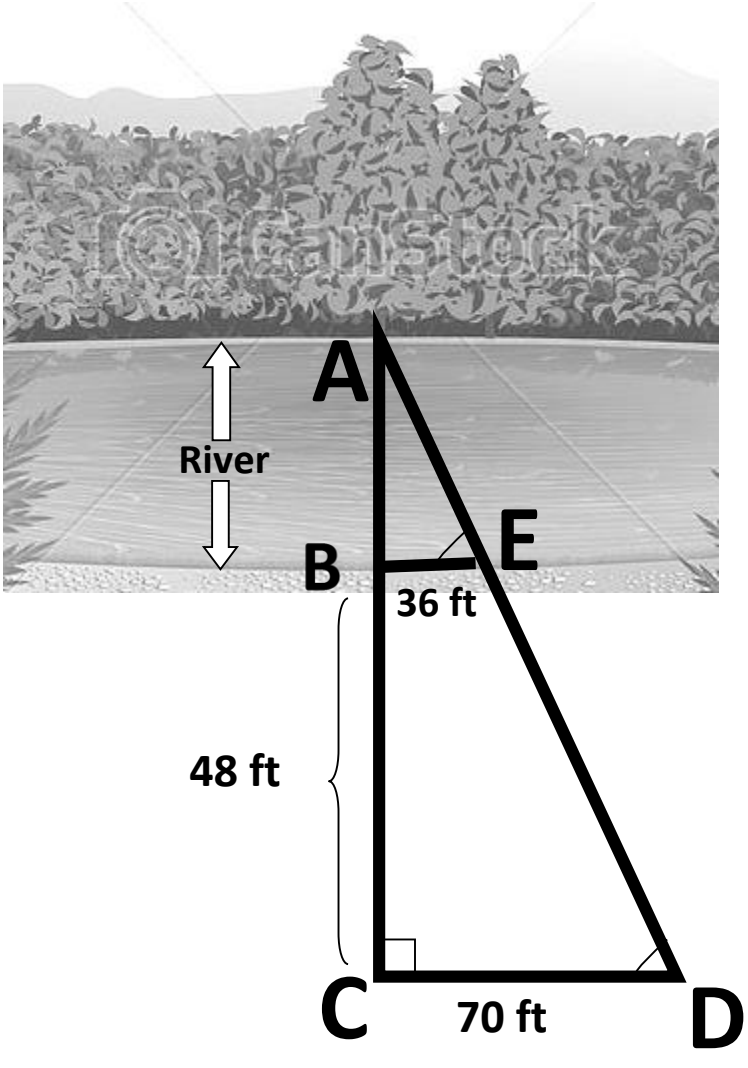


X= _____

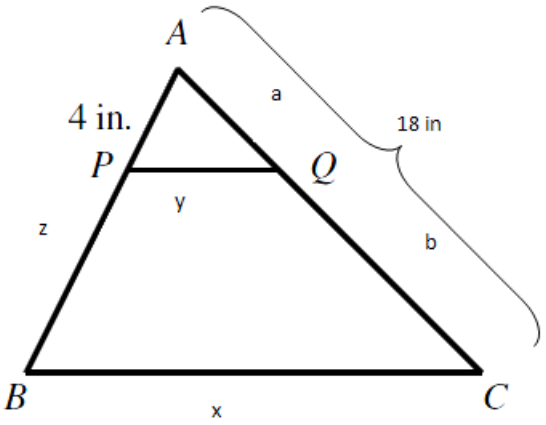
Y= _____

z= _____

69. How wide is the river?
Round to the nearest tenth of a foot.



70. The perimeter of △ABC = 54 inches, a = 6 inches and the perimeter of △APQ = 18 inches.
△ABC ~ △APQ. Find b, x, y, and z.



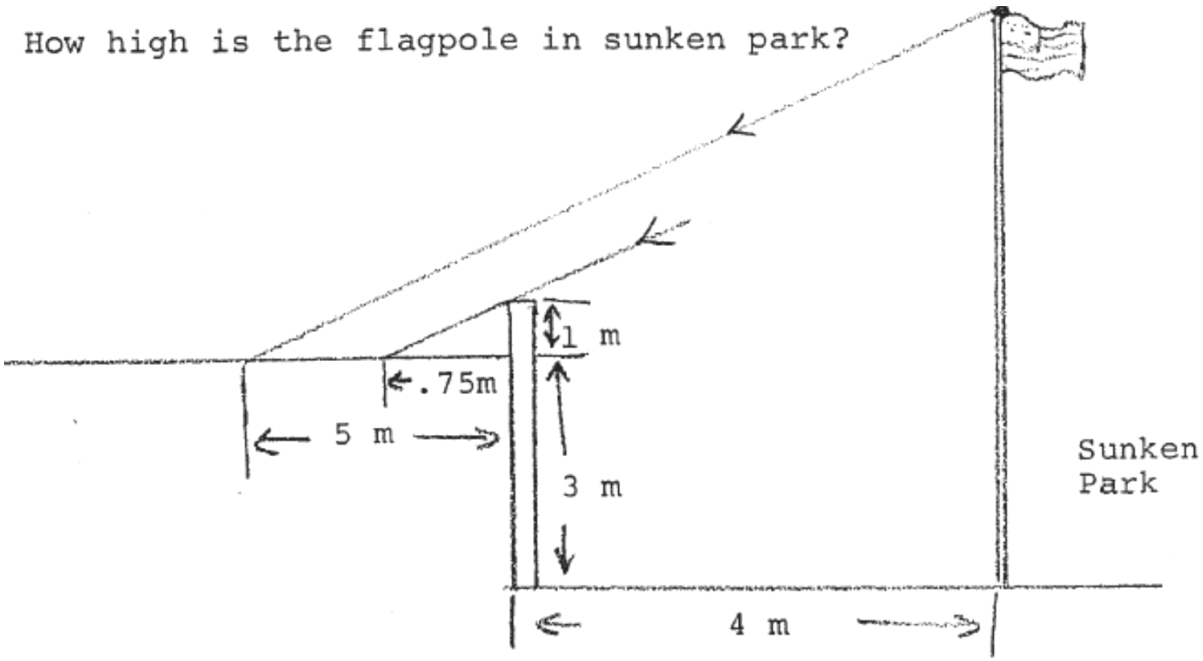
b = _____

x = _____

y = _____

z = _____

71. How high is the flagpole in sunken park?



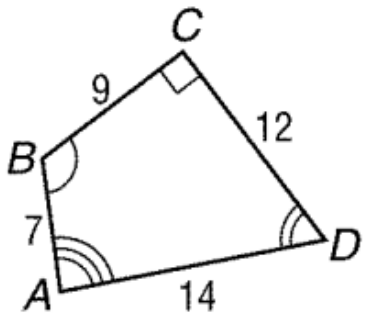
72. A basketball player made 36 free throws in 16 games. Find the ratio of games to free throws.

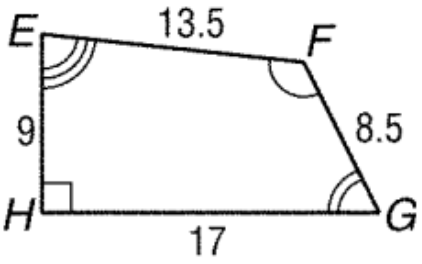
a. 4:9
b. 9:4
c. 6:4
d. 9:5

73. There are 84 boys in a freshman class of 146 students. Find the ratio of boys to girls.

a. 42:73
b. 31:42
c. 42:31
d. 73:42

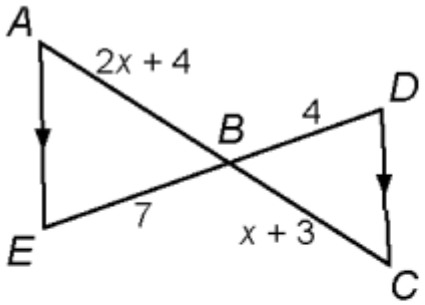
74. Determine whether quadrilateral *ABCD* ~ quadrilateral *EFGH*. Justify your answer.





75. The ratio of the measures of the three angles of a triangle is 3:4:8. Find the measure of the largest angle.

76. Complete the similarity statement. Find x, AB and BC



△ABE ~ _____

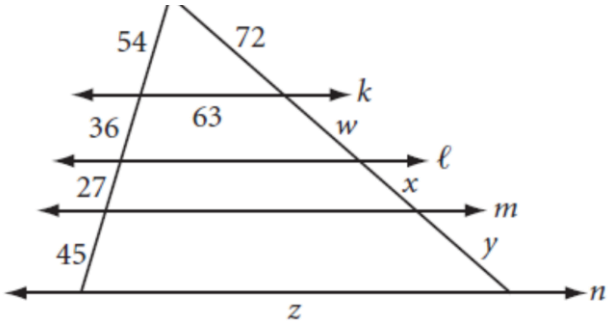
x= _____

AB= _____

BC= _____

77.

$k \parallel \ell \parallel m \parallel n$



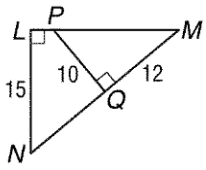
$w =$ _____

$x =$ _____

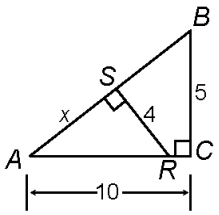
$y =$ _____

$z =$ _____

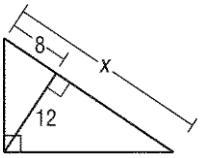
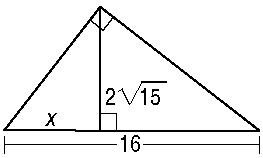
78. State the similarity statement and find LM.



79. State the similarity statement and find x.



80. Find x.



81. Find x.