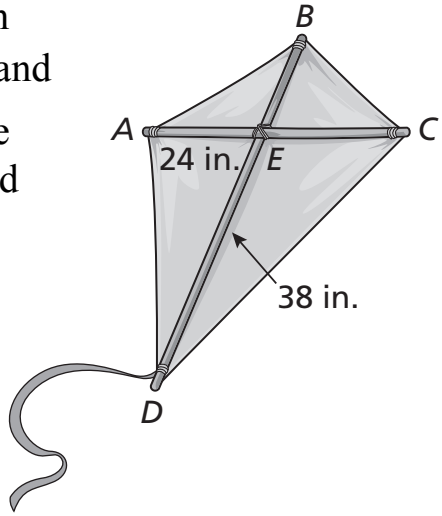
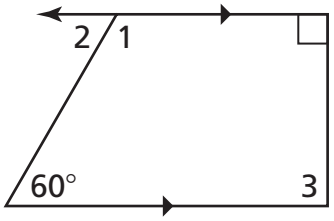
7.5 Start Thinking

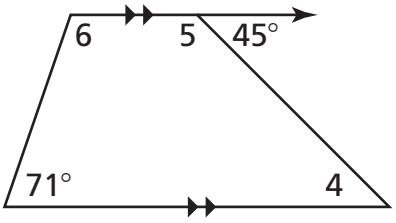
A kite is to be constructed according to the diagram with $1\frac{1}{4}$ yards of nylon fabric, one 38-inch dowel, and one 24-inch dowel. Describe the construction of the kite in geometric terms. Reference the segments and angles shown in the diagram.



7.5 Warm Up

Use the diagrams to determine the measure of the angle.





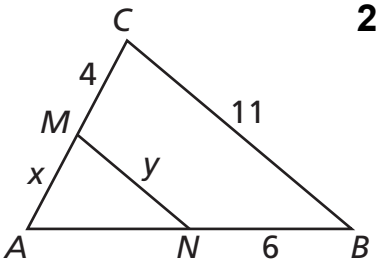
1. $m\angle 1$ **2.** $m\angle 2$ **3.** $m\angle 3$

4. $m\angle 4$ **5.** $m\angle 5$ **6.** $m\angle 6$

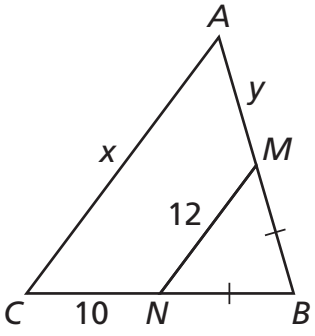
7.5 Cumulative Review Warm Up

$\overline{MN}$ is a midsegment of $\triangle ABC$. Find the values of x and y.

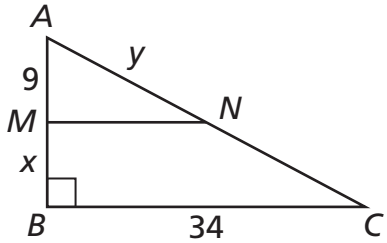
1.



2.



3.

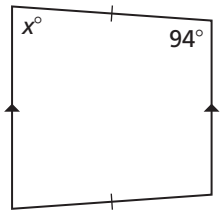


Name _____ Date _____

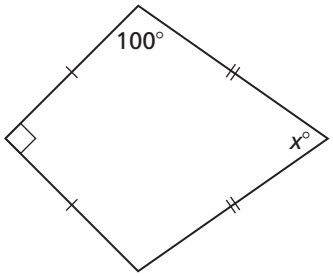
7.5 Practice A

In Exercises 1 and 2, find the value of *x*.

1.



2.



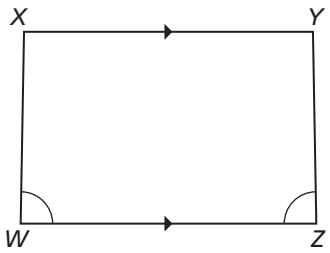
In Exercises 3 and 4, find the length of the midsegment of the trapezoid with the given vertices.

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

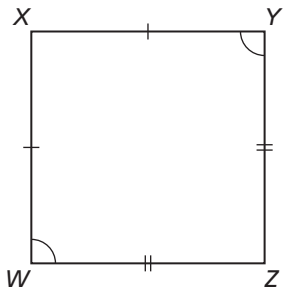
4. $E(-3, 3), F(1, 3), G(3, -3), H(-5, -3)$

In Exercises 5 and 6, give the most specific name for the quadrilateral. Explain your reasoning.

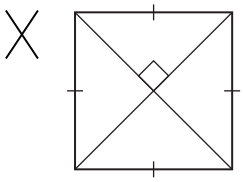
5.



6.



7. Describe and correct the error in finding the most specfice name for the quadrialteral.



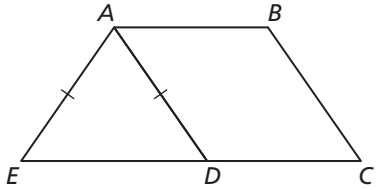
The quadrilateral has two pairs of consecutive congruent sides and the diagonals are perpendicular. So, the quadrilateral is a kite.

8. Use the diagram to write a two-column proof.

Given: $ABCD$ is a parallelogram.

$\overline{AE} \cong \overline{AD}$

Prove: $ABCE$ is an isosceles trapezoid.

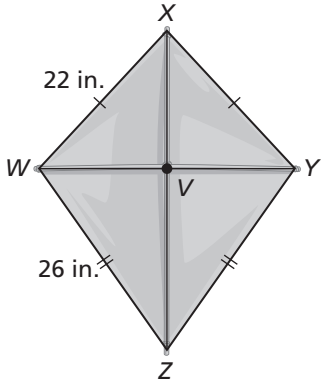


9. The figure shows a window in the shape of a kite.

a. Find $m\angle XVW$.

b. Find $\overline{XY}$.

c. Which angle is congruent to $\angle XYZ$?



Name_____ Date _____

7.5 Practice B

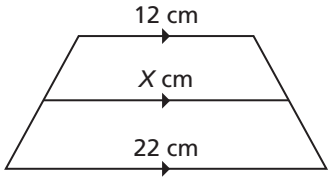
In Exercises 1 and 2, show that the quadrilateral with the given vertices is a trapezoid. Then decide whether it is isosceles.

1. $T(-1, -2)$, $U(-1, 3)$, $V(3, 4)$, $W(3, -3)$

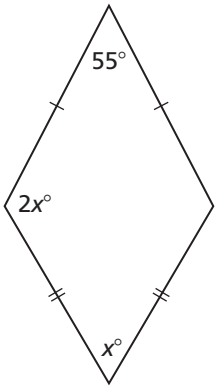
2. $P(0, 0)$, $Q(2, 4)$, $R(5, 4)$, $S(5, 0)$

In Exercises 3 and 4, find the value of *x*.

3.

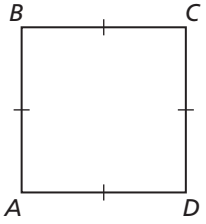


4.

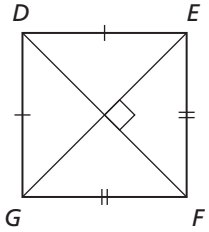


In Exercises 5 and 6, give the most specific name for the quadrilateral. Explain your reasoning.

5.



6.

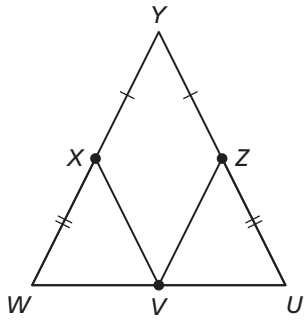


7. Use the diagram to write a two-column proof.

Given: $VXYZ$ is a kite.

$\overline{XY} \cong \overline{YZ}$, $\overline{WX} \cong \overline{UZ}$

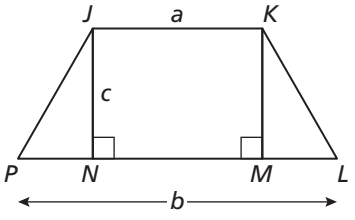
Prove: $\triangle WXV \cong \triangle UZV$



8. Three vertices of a trapezoid are given by $(3, -6)$, $(3, -2)$, and $(6, -8)$. Find the fourth vertex such that the trapezoid is an isosceles trapezoid.

9. Is it possible to have a concave kite? Explain your reasoning.

10. The diagram shows isosceles trapezoid $JKLP$ with base lengths a and b, and height c.



a. Explain how you know $JKMN$ is a rectangle. Write the area of $JKMN$.

b. Write the formula for the area of $\triangle JNP$.

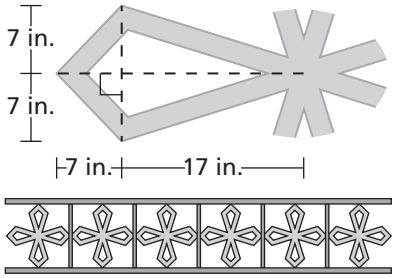
c. Write and simplify the formula for the area of trapezoid $JKLP$.

Name _____ Date _____

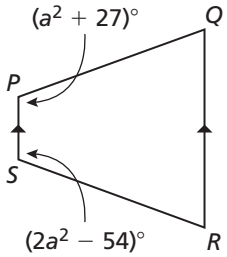
7.5 Enrichment and Extension

Properties of Trapezoids and Kites

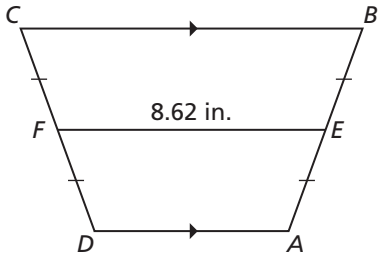
1. Each square section in an iron railing contains four small kites. The figure shows the dimensions of one kite. What length of iron is needed to outline one small kite? How much iron is needed to outline one complete section, including the square?



2. Find the value of a in the figure to the right so that $PQRS$ is isosceles.



3. The perimeter of an isosceles trapezoid $ABCD$ is 27.4 inches. If $BC = 2(AB)$, find AD, AB, BC, and CD.



In Exercises 4 and 5, the given coordinates represent three vertices of an isosceles trapezoid. Write the coordinates of the point that could be the fourth vertex.

4. $(a, b), (a, -b), (a + 3, b)$

5. $(a, b), (a, b - c), (a - c, b - 2c)$

6. One base of a non-isosceles trapezoid has the vertices $(x, y + z)$ and $(x + z, y + 2z)$. A third vertex is the point (x, y). Describe the set of points that could be the fourth vertex.

7. If the coordinates $(0, 0)$, $(2, 5)$, and $(5, 2)$ represent three vertices of a convex kite, describe the coordinates of each point that could be the fourth vertex.

Name_____ Date _____

7.5 Puzzle Time

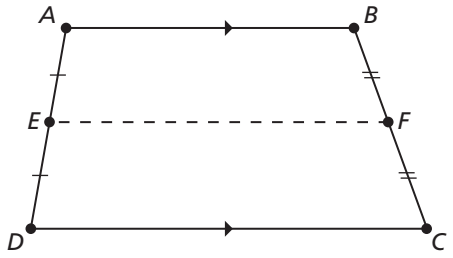
What Word Is Always Spelled Incorrectly?

Circle the letter of each correct answer in the boxes below. The circled letters will spell out the answer to the riddle.

Complete the sentence.

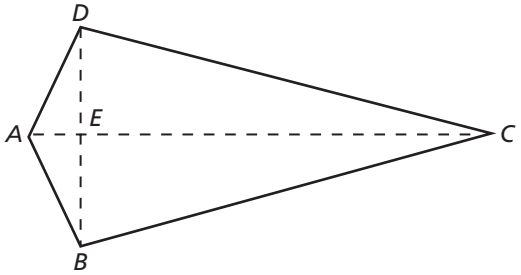
1. A _____ is a quadrilateral with exactly one pair of parallel sides.
2. The parallel sides of a trapezoid are the _____.
3. Base angles of a trapezoid are two _____ angles whose common side is a base.
4. The nonparallel sides are the _____ of the trapezoid.
5. If the legs of a trapezoid are congruent, then the trapezoid is an _____ trapezoid.
6. A trapezoid is isosceles if and only if its _____ are congruent.
7. The _____ of a trapezoid is parallel to each base and its length is one-half the sum of the lengths of the bases.
8. If a quadrilateral is a _____, then its diagonals are perpendicular.

Find the indicated measurement using quadrilateral *ABCD* as a reference.



9. $\overline{AD} \cong \overline{BC}$, $m\angle D = 75°$. Find $m\angle A$.
10. $AB = 17$, $DC = 25$. Find EF.

Find the indicated measurement using quadrilateral *ABCD* as a reference.



11. $\overline{AD} \cong \overline{AB}$, $\overline{DC} \cong \overline{BC}$, $m\angle A = 130°$, $m\angle C = 30°$. Find $m\angle B$.

G	I	N	U	C	N	O	Y	R	R
9	kite	21	point	trapezoid	18	100°	3	105°	consecutive
E	**G**	**C**	**A**	**T**	**O**	**L**	**S**	**T**	**Y**
bases	21	legs	1	midsegment	median	diagonals	0	altitude	isosceles