

1. Each is a parallelogram. Solve for x and y:

a.
$$\begin{cases} 2x+3y=14 \\ 8x-y=4 \end{cases} \cdot 3$$

$$\begin{array}{r} 2x+3y=14 \\ 24x-3y=12 \\ \hline 26x=26 \\ x=1 \end{array}$$

$$\begin{array}{r} 8(1)-y=4 \\ 8-y=4 \\ \underline{y=4} \end{array}$$

b.
$$\frac{120}{3} = \frac{3y}{3} \Rightarrow 40 = y$$

$$\frac{5x+10}{5} = \frac{60}{5} \Rightarrow 5x+10=60 \Rightarrow 5x=50 \Rightarrow x=10$$

c.
$$\frac{78}{x} = \frac{50}{50} \Rightarrow x=78$$

$$\frac{50}{y} = \frac{78}{78} \Rightarrow y=50$$

d.
$$\frac{x^2+5}{x^2+5} = \frac{9}{9} \Rightarrow x^2+5=9 \Rightarrow x^2=4 \Rightarrow x=\pm 2$$

$$\frac{v^2}{v^2} = \frac{v+6}{v+6} \Rightarrow v^2=v+6 \Rightarrow y^2-y-6=0 \Rightarrow (y-3)(y+2)=0 \Rightarrow y=3, y=-2$$

2. The trapezoids below are isosceles trapezoids. Find the values of x and y:

a.
$$\frac{5y}{5} = \frac{28}{28} \Rightarrow y=9$$

$$\frac{3x^2+1}{3} = \frac{28}{3} \Rightarrow 3x^2+1=28 \Rightarrow 3x^2=27 \Rightarrow \sqrt{x^2}=9 \Rightarrow x=\pm 3$$

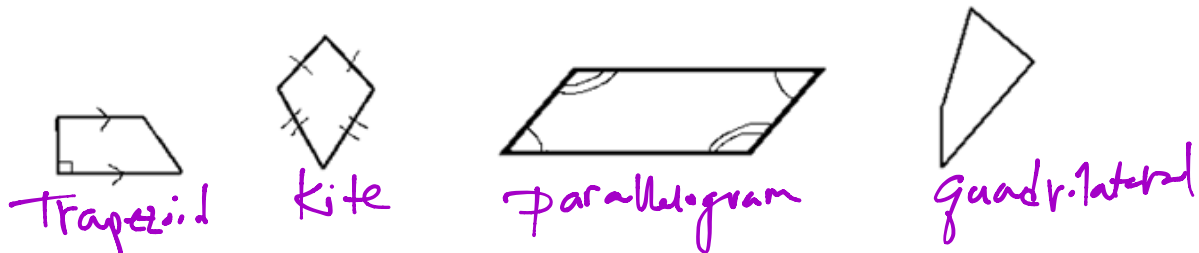
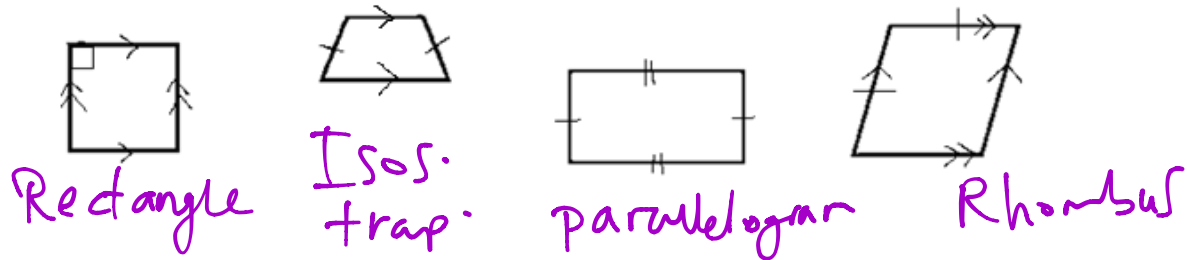
b.
$$\frac{30}{30} = \frac{50}{50} \Rightarrow x=100$$

$$\frac{130}{130} = \frac{180}{180} \Rightarrow y=20$$

In #2b, x and y are alternate interior angles. Why are they not congruent?

lines are not parallel.

3. Identify each of the following using its most specific name:



4. Name **ALL** the figure(s) for which the following are **always** true:

- a parallelogram whose sides are all congruent: Rhombus, Square
- a parallelogram whose angles are all congruent: rectangle, Square
- a parallelogram whose diagonals are perpendicular: Rhombus, Square
- a parallelogram whose diagonals are congruent and perpendicular: Square
- a quadrilateral with only 2 congruent sides: isosceles trapezoid
- a quadrilateral with no parallel sides: Kite
- a quadrilateral whose diagonals are congruent: rectangle, Square, Isos. trap.
- a quadrilateral with 2 pairs of congruent angles: rect., square, isos trap.
- a quadrilateral with only one pair of parallel sides: trapezoid
- a quadrilateral whose diagonals bisect each other: all parallelograms

5. Always, sometimes, or never true?

a. A A rectangle is a parallelogram.

b. N A trapezoid is a kite.

c. A A square is a rhombus.

d. S A quadrilateral is a rectangle.

e. A The diagonals of a rhombus are perpendicular.

f. A The diagonals of a rectangle are congruent.

g. S The diagonals of a rectangle are perpendicular.

h. S Opposite angles of a parallelogram are supplementary.

i. A An isosceles trapezoid is a quadrilateral.

6. Name three types of parallelograms: Rectangles, Rhombuses, Squares

7. Name a special type of trapezoid: Isosceles trapezoid

8. Name all of the quadrilaterals whose diagonals are always congruent:

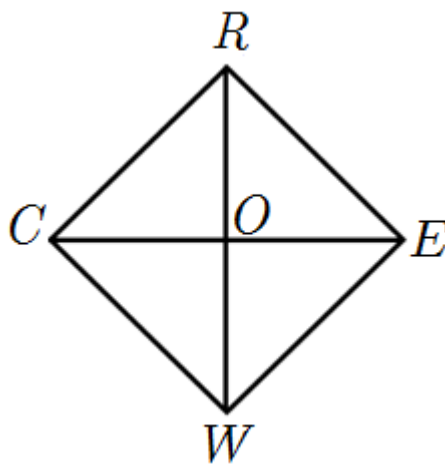
Rectangle, Square, Isos. trap.

9. Name all of the quadrilaterals whose diagonals are always perpendicular:

Square, Rhombus, Kite

10. Name all of the quadrilaterals whose diagonals always bisect each other:

All parallelograms



11. CREW is a **parallelogram**.

a. Name a segment congruent to \overline{CO} . \overline{EO}
 Why? Diagonals bisect each other

b. Name a segment congruent to \overline{CW} . \overline{RE}
 Why? Opp. sides \cong

c. Name an angle congruent to $\angle CWR$. $\angle ERW$
 Why? Alt. Int. angles

d. Name an angle congruent to $\angle CRE$. $\angle CWE$
 Why? Opp. angles \cong

e. If $OE = 4$ and $WE = 8$, name 2 segments that are congruent to \overline{WE} .

\overline{CR} , \overline{CE}

f. If $\angle COW$ were a right angle, what type of parallelogram would CREW have to be? Rhombus

Why? diagonals of a Rhombus are \perp .