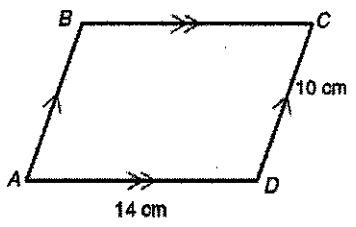
Geometry A
6.1 Properties of Parallelograms

Name Key
Hour _____ **Date** _____

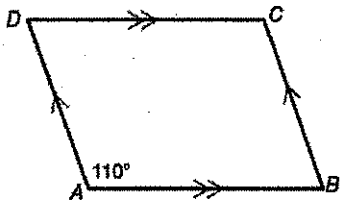
Assignment

Find each indicated measure in parallelogram *ABCD*.



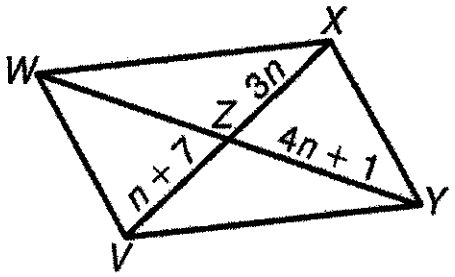
1. $AB =$ 10 cm
2. $BC =$ 14 cm

Find each indicated measure in parallelogram *ABCD*.



3. $m\angle B =$ 70°
4. $m\angle C =$ 110°
5. $m\angle D =$ 70°

***VWXY* is a parallelogram. Find each indicated measure. <u>Show all calculations.</u>**



6. $VX =$ 21
7. $XZ =$ 10.5
8. $ZW =$ 15
9. $WY =$ 30

Suppose that $\overline{AB}$ has endpoints $A(-3, 6)$ and $B(1, -4)$.

10. Find the length of $\overline{AB}$. 10.78

11. Find the midpoint of $\overline{AB}$. $(-1, 1)$

12. Find the slope of $\overline{AB}$ -2.5

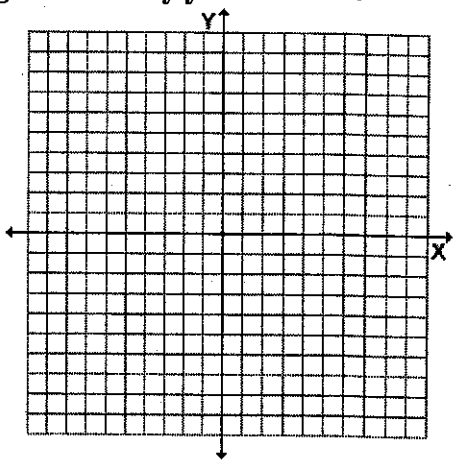
Geometry A
6.2 Proving a Quadrilateral is a Parallelogram

Name _____
Hour _____ **Date** _____

Assignment

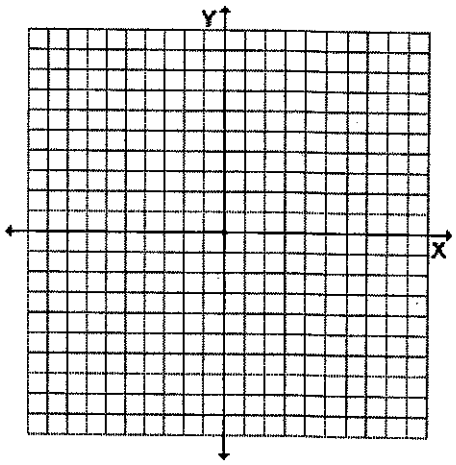
Determine whether a figure with the given vertices is a parallelogram. Justify your answer.

1. $Q(-6, -6)$, $R(2, 2)$, $S(-1, 6)$, $T(-5, 2)$; **Show all calculations.**
Use the **slope formula.**



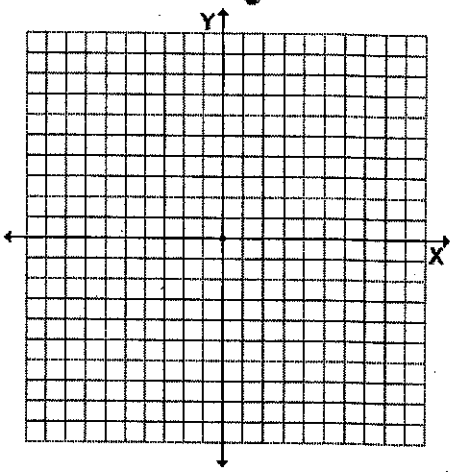
Parallelogram? no Justification opposite sides are not parallel

2. $W(-6, -5)$, $X(-1, -4)$, $Y(0, -1)$, $Z(-5, -2)$; **Show all calculations.**
Use the **distance formula.**



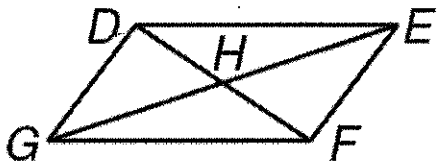
Parallelogram? yes Justification opposite sides are congruent

3. $H(5, 6)$, $J(9, 0)$, $K(8, -5)$, $L(3, 2)$; **Show all calculations.**
Use the **midpoint formula.**



Parallelogram? no Justification diagonals do not bisect

Review:
Complete each statement about parallelogram *DEFG*. Justify your answer.



Statement	Justification
1. $\overline{DE} \parallel$ $\overline{GF}$	1. opp sides are parallel
2. $\overline{FE} \cong$ $\overline{GD}$	2. opp sides are parallel
3. $\overline{FH} \cong$ $\overline{HD}$	3. diagonals bisect
4. $\angle EFG \cong \angle GDE$	4. opp angles $\cong$
5. $\angle DEF$ is supplementary to $\angle GDE$ and $\angle GFE$	5. consecutive angles supplementary

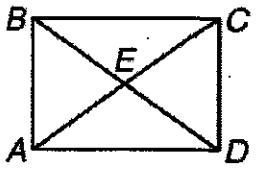
Geometry A
6.3 Properties of Rectangles

Name _____
Hour _____ **Date** _____

Assignment

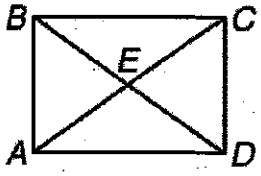
***ABCD* is a rectangle.**

1. If $AC = 2x + 13$ and $DB = 4x - 1$, find x. **Show your calculations.**



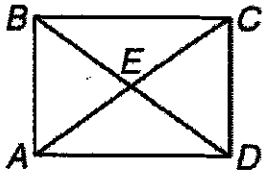
$x = 7$

2. If $AC = x + 3$ and $DB = 3x - 19$, find AC. **Show your calculations.**



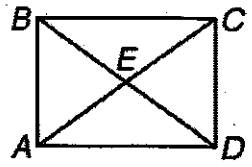
$AC = 14$

3. If $m\angle DAC = 2x + 4$ and $m\angle BAC = 3x + 1$, find x. **Show your calculations.**



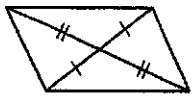
$x = 17$

4. If $m\angle BDC = 7x + 1$ and $m\angle ADB = 9x - 7$, find $m\angle CBD$. **Show your calculations.**



$m\angle CBD = 47°$

5. Is there enough information to state that the figure below is a parallelogram? yes

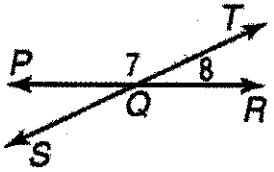


Justification diagonals bisect

6. R is between J and K. Find n if $JR = 2n - 12$, $RK = 3n + 10$, and $JK = 33$ cm.

$n = 7$

7. If $m\angle 7 = 5x - 5$ and $m\angle 8 = 4x + 14$, find the value of x.



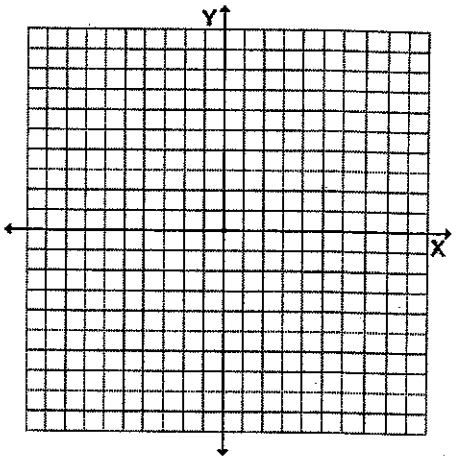
$x = 19$

Geometry A
6.4 Proving a Quadrilateral is a Rectangle

Name _____
Hour _____ **Date** _____

Assignment

1. Determine whether $W(-4, 5)$, $X(6, 0)$, $Y(3, -6)$, and $Z(-7, -1)$ are vertices of a rectangle. **Show all work.** (Hint: use the midpoint formula and distance formula).



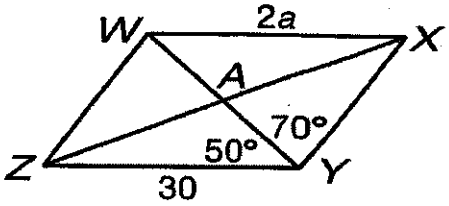
(*WXYZ* is) / is not a rectangle.

Justification: diagonals bisect and are congruent.

2. *WXYZ* is a parallelogram. Find each indicated value.

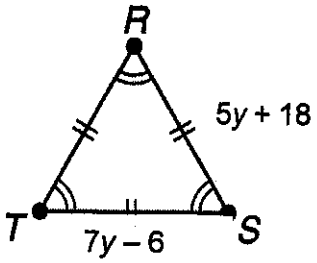
$a =$ 15 $m\angle YWX =$ 50°

$m\angle YWZ =$ 70° $m\angle XYZ =$ 120°



3. Find the perimeter of ΔRST.

P = 234



4. **Given:** $\angle A$ and $\angle B$ are vertical angles.
Conjecture: $\angle A \cong \angle B$
Which of the following would be a counterexample to the conjecture?

D

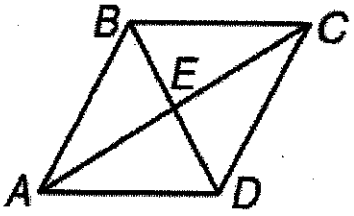
A. $m\angle A = 45$ and $m\angle B = 45$
B. $m\angle A = 100$ and $m\angle B = 80$
C. $m\angle A = 90$ and $m\angle B = 90$
D. None of the above, because the conjecture is true.

Geometry B
6.5 Properties of Rhombi and Squares **Assignment**

Name _____
Hour _____ **Date** _____

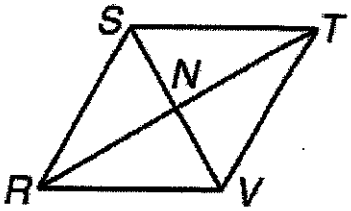
In rhombus *ABCD*, *BE* = 18, and *AE* = 24.

1. $AB =$ 30
2. $BC =$ 30
3. $AD =$ 30
4. $DE =$ 18
5. $CE =$ 24
6. $AC =$ 48
7. $DB =$ 36
8. $m\angle AED =$ 90°



In rhombus *STVR*, $m\angle STN = 25°$.

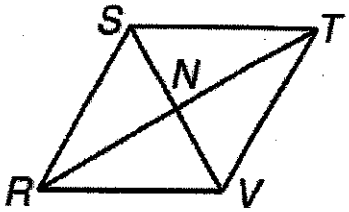
9. $m\angle VTN =$ 25°
10. $m\angle TVS =$ 65°
11. $m\angle RVS =$ 65°
12. $m\angle SRT =$ 25°
13. $m\angle VRT =$ 25°
14. $m\angle RST =$ 130°
15. $m\angle STV =$ 50°
16. $m\angle RNV =$ 90°



In rhombus *RSTV*, *RS* = 5*y* + 2, *ST* = 3*y* + 6, *NV* = 6, and $m\angle NTV = 30°$.

17. Find the value of *y*. **Show all calculations.**

y = 2

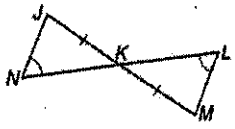


18. Find *TV*. **Show all calculations.**

TV = 12

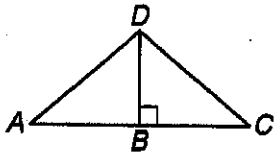
Identify the triangle congruence postulate that could be used to prove that each pair of triangles are congruent based on the given information. If it is not possible to prove that the triangles are congruent, choose "not possible."

19.



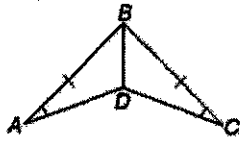
AAS

20.



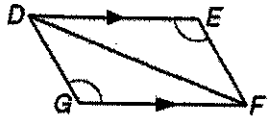
Not possible

21.



Not possible

22.



AAS

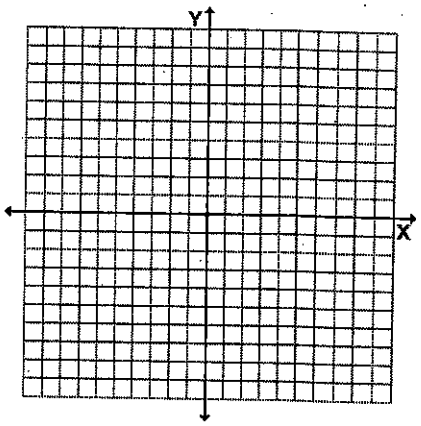
Geometry A
6.6 Proving that a Quadrilateral is a Rhombus or a Square

Name _____
Hour _____ **Date** _____

Assignment

Given each set of vertices, determine whether *QRST* is a parallelogram, rhombus, rectangle, or square. List all that apply. Justify your reasoning. Show all calculations.

1. $Q(-4, 5)$, $R(4, 1)$, $S(1, -5)$, $T(-7, -1)$



QRST is a (circle all that apply)

Parallelogram *Rectangle* ~~*Rhombus*~~ ~~*Square*~~

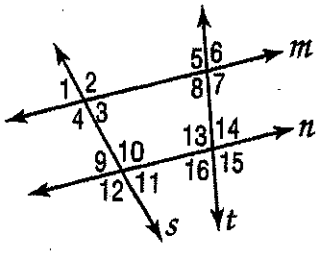
2. Which one of the following pairs of slopes are slopes corresponding to parallel lines? B

A. $\frac{5}{3}$ and $\frac{6}{10}$ **(B.)** $\frac{5}{3}$ and $\frac{20}{12}$ **C.** $-\frac{10}{6}$ and $\frac{5}{3}$ **D.** $\frac{5}{3}$ and $-\frac{9}{15}$

3. Which one of the following pairs of slopes are slopes corresponding to perpendicular lines? D

A. $\frac{5}{3}$ and $\frac{6}{10}$ **B.** $\frac{5}{3}$ and $\frac{20}{12}$ **C.** $-\frac{10}{6}$ and $\frac{5}{3}$ **(D.)** $\frac{5}{3}$ and $-\frac{9}{15}$

4. Which angle pair are $\angle 11$ and $\angle 16$ in the figure at the right? E



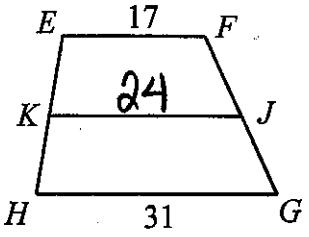
A. Vertical Angles (VA)
B. Corresponding Angles (CA)
C. Alternate Interior Angles (AIA)
D. Alternate Exterior Angles (AEA)
(E.) Consecutive Interior Angles (CIA)

Geometry A
6.7 Trapezoids

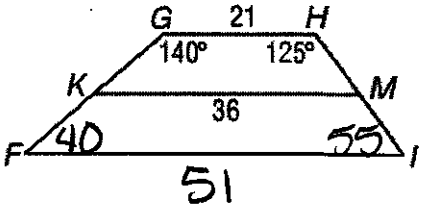
Name _____
Hour _____ **Date** _____

Assignment

1. For trapezoid *EFGH*, *J* and *K* are the midpoints of the legs. Find *JK*. **Show all calculations.**



2. For trapezoid *FGHI*, *K* and *M* are the midpoints of the legs. Find *FI*, $\angle F$ and $\angle I$. **Show all calculations.**

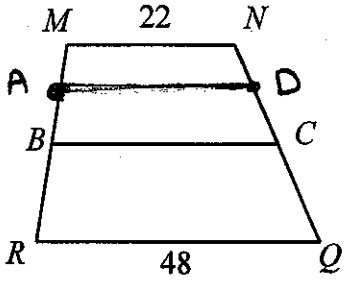


3. In trapezoid *MNQR*, *B* and *C* are midpoints of the legs. Let $\overline{AD}$ be the median of *MNCB*.

a. Draw and label $\overline{AD}$ on the figure.

b. Find *AD*.
Show all calculations.

AD = 28.5

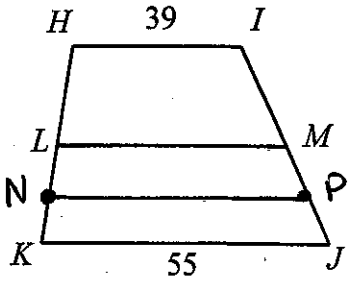


4. In trapezoid *HIJK*, *L* and *M* are midpoints of the legs. Let $\overline{NP}$ be the median of *LMJK*.

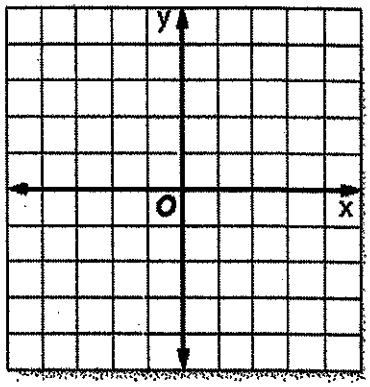
a. Draw and label $\overline{NP}$ on the figure.

b. Find *NP*.
Show all calculations.

NP = 51



5. Verify that *A*(-3, -2), *B*(4, -2), *C*(-1, 5), and *D*(2, 5), are vertices of a trapezoid. Justify your answer.



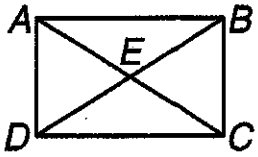
ABCD is a trapezoid.

Justification: exactly one pair of parallel sides

6. $CDEF$ is a parallelogram. $m\angle D = 47^\circ$. Find the indicated values.

$m\angle C =$ 133 $m\angle E =$ 133 $m\angle F =$ 47

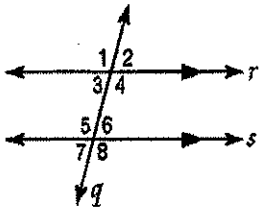
7. $ABCD$ is a rectangle. If $m\angle DAC = 7x + 1$ and $m\angle BAC = 9x - 7$, find $m\angle DCA$. **Show all calculations.**



$m\angle DCA = 47^\circ$

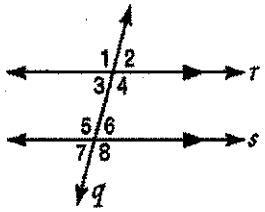
In problems #8 and 9, $r \parallel s$. Solve for x, then find the measures of the indicated angles.

8. $m\angle 4 = x + 35$, $m\angle 6 = 4x + 10$



$x =$ 27, $m\angle 4 =$ 62, $m\angle 2 =$ 118

9. $m\angle 5 = 6x + 12$, $m\angle 4 = 7x - 9$



$x =$ 21, $m\angle 4 =$ 138, $m\angle 6 =$ 42

State the property, definition, theorem, or postulate that justifies each statement.

10. $CD = CD$. reflexive

11. If $\overline{AB} \cong \overline{BC}$ and $\overline{BC} \cong \overline{CE}$, then $\overline{AB} \cong \overline{CE}$. Transitive

12. If N is between M and P, then $MN + NP = MP$. SAP (Segment Addition Postulate)

13. If $\overline{MN} \cong \overline{PQ}$, then $\overline{PQ} \cong \overline{MN}$. Symmetric

14. If $m\angle 7 + m\angle 8 = 85^\circ$ and $m\angle 8 = 41^\circ$, then $m\angle 7 + 41^\circ = 85^\circ$. Substitution

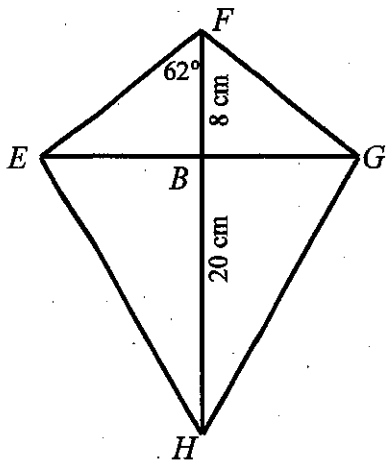
15. If R is the midpoint of $\overline{QT}$, then $\overline{QR} \cong \overline{RT}$. Midpoint Thm.

Geometry A
6.8 Kites & Quadrilaterals

Name _____
Hour _____ **Date** _____

Assignment

1. *EFGH* is a kite with ends *F* and *H*. If *EG* = 30 cm, find the indicated lengths and angle measures.



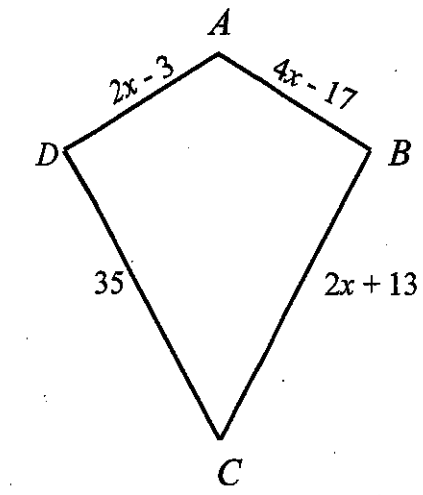
EB = 15 *BG* = 15

EF = 17 *FG* = 17

EH = 25 *GH* = 25

$m\angle GBH$ = 90 $m\angle BEF$ = 28

2. Given ABCD is a kite with ends *A* and *C*, solve for *x* and find all missing side lengths.



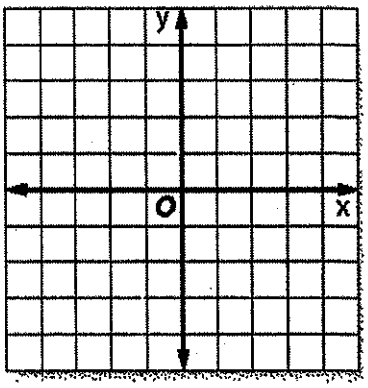
x = 7

DA = 11

BA = 11

BC = 27

3. Verify that *A*(1, -3), *B*(4, -2), *C*(3, 1), and *D*(-2, 1), are vertices of a kite. Justify your answer.



ABCD is a kite.

Justification: diagonals are perperdicular

For # 4-11, fill in the blanks.

4. The diagonals of a parallelogram bisect one another.

5. Opposite angles of a parallelogram are congruent.

6. Opposite sides of parallelograms are parallel and congruent

7. Consecutive angles of parallelograms are supplementary

8. The diagonals of a rectangle are congruent.

9. All angles of a rectangle are 90°.

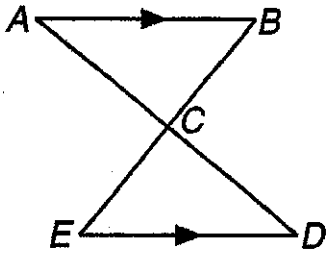
10. The diagonals of a rhombus are perpendicular and bisect each other.

11. All sides of a rhombus are congruent.

12. Complete the following proof:

Given: C is the midpoint of $\overline{AD}$
C is the midpoint of $\overline{BE}$

Prove: $\Delta ABC \cong \Delta DEC$



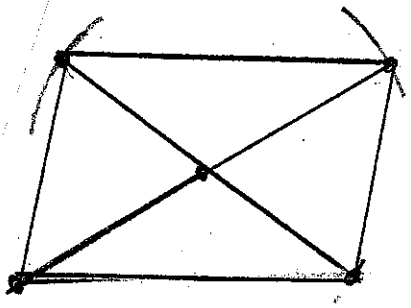
Statements	Reasons
1. C is the midpoint of $\overline{AD}$	1. Given
2. $\overline{AC} \cong \overline{DC}$	2. Midpoint Theorem
3. C is the midpoint of $\overline{BE}$	3. Given
4. $\overline{BC} \cong \overline{EC}$	4. Midpoint Theorem
5. $\angle ACB \cong \angle DCE$	5. Vertical Angles Theorem
6. $\Delta ABC \cong \Delta DEC$	6. SAS

Geometry A
6.9 Constructions of Quadrilaterals

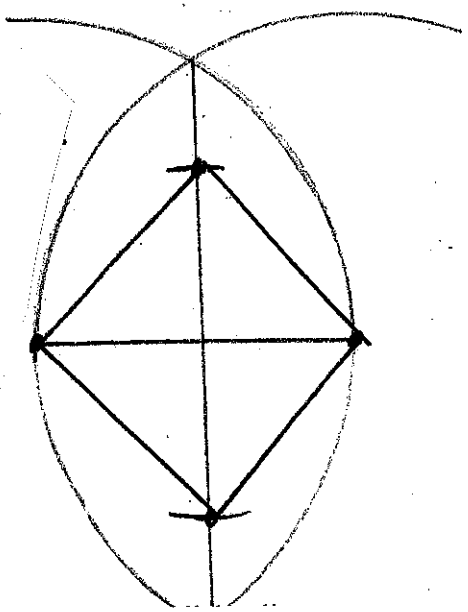
Name _____
Hour _____ **Date** _____

Assignment

1. Construct a parallelogram.

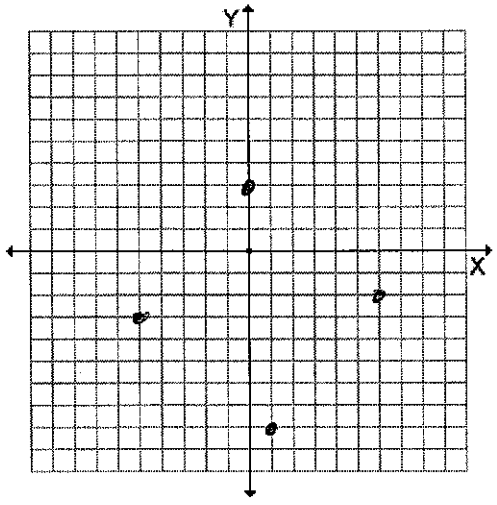


2. Construct a square.



3. Determine whether the quadrilateral with the given vertices is a parallelogram, rectangle, rhombus, or square. Circle all that apply. Show all calculations.

   $B(0, 3)$, $E(6, -2)$, $F(1, -8)$, $G(-5, -3)$



BEFG is a (circle all that apply)

Parallelogram *Rectangle* *Rhombus* *Square*