Name __Key__   Hour _____

Polygon Unit Test Review 2016 Schmidt

Directions: You must show all work for all problems below. For the problems where you have a quadrilateral and use their properties, justify the set up, and provide the geometry. (Some may not have the information to do everything i.e. if no points are there, you cannot show the geometry). Failure to do so will result in a zero.

1. Find the sum of the measures of the interior angles of a convex 39-gon. $S = 180(n-2)$

$$S = 180(39-2) \qquad \boxed{S = 6,660°}$$

2. Find the sum of the measures of the interior angles of a convex 26-gon.

$$S = 180(26-2)$$
$$\boxed{S = 4,320°}$$

3. Fill in the following table:

Number of Sides	Name of Polygon
3	triangle
4	quadrilateral
5	pentagon
6	hexagon
7	heptagon
8	octagon
9	nonagon
10	decagon
11	und.
12	dodecagon
n	n-gon 36-gon

4. For parallelogram *RSTU*, find $m\angle RSU$ and $m\angle RUS$.
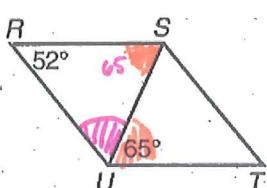
$m\angle RSU = \underline{65°}$ $m\angle RUS = \underline{63°}$

Geometry: $\angle RSU = \angle SUT$
Justify: || lines form $\cong$ alt. int $\angle$s

Geometry: $\angle R + \angle RSU + \angle RUS = 180$
$52 + 65 + \angle RUS = 180$
$117 + \angle RUS = 180$
$\angle RUS = 63°$
Justify: $\triangle$ sum

5. Solve for the missing angle or variable for the following PARALLELOGRAMS.

a.) Find x.

W _____ X
4x + 14
122°
V _____ Y
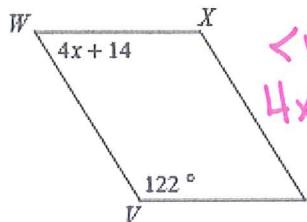
Geometry:

$\angle W + \angle V = 180$
$4x + 14 + 122 = 180$
$4x + 136 = 180$
$4x = 44$
$\boxed{x = 11}$
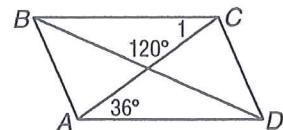
Justify:

con. int $\angle s$
of a para
are suppl.

b) Find m<1.

B _____ C
120° 1
36°
A _____ D

Geometry:

$\angle 1 = \angle CAD$
$\boxed{\angle 1 = 36°}$

Justify:

// lines form
$\cong$ alt. int $\angle s$

C. Find all variables.

12
48°
a
y°
c
x°
7
5
46°
36°
b
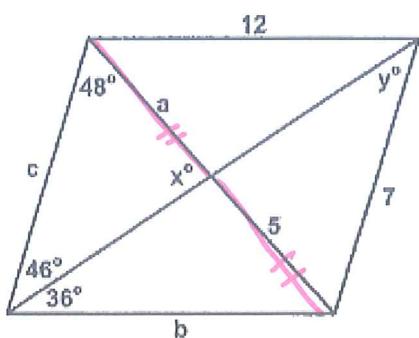
$a = 5$ diags of a para bisect each other.
$b = 12$ op. sides of a para are $\cong$
$c = 7$ op. sides of a para are $\cong$
$x = 86°$ by $\triangle$ sum thm
$y = 46°$ // lines form $\cong$ alt. int $\angle s$.

6. Find x so that the quadrilateral is a parallelogram. Then find the side length of MP, QP, and MN.

M __5x-6__ N
Q __4x__ P
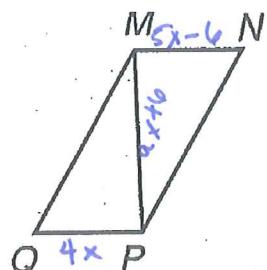
$MP = 9x + 6$
$QP = 4x$
$MN = 5x - 6$

Geometry:

$MN = QP$
$5x - 6 = 4x$
$-6 = -1x$
$\boxed{6 = x}$

$MP = 9(6) + 6 = 60, QP = 4(6) = 24, MN = 5(6) - 6$
$= 24$

Justify:

op. sides of a
Para are $\cong$

x = ___6___   MP = ___60___   QP = ___24___   MN = __24__

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7.   ABCD is a square. If AC = 16 and BD = 2x + 4, find x.

Geometry: Justify:

$AC \cong BD$ diags of squares

$16 = 2x + 4$ are $\cong$

$\underline{-4 \qquad -4}$

$12 = 2x$

$\boxed{6 = x}$
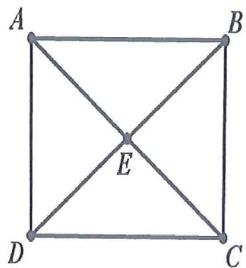
8. Rhombus Practice:

a.) For rhombus *ABCD*, $m\angle 8 = 35$, find the $m\angle 1$, $m\angle 2$, $m\angle 3$, $m\angle 4$, $m\angle 5$, $m\angle 6$, and $m\angle 7$.
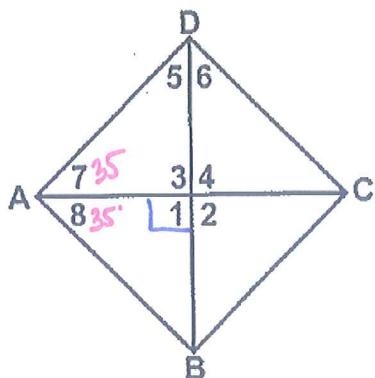
$m\angle 1 = \underline{90°}$ Because: diags of a Rhombus are $\perp$ to each other

$m\angle 2 = \underline{90°}$ Because: same

$m\angle 3 = \underline{90°}$ Because: "   "

$m\angle 4 = \underline{90°}$ Because: "   "

$m\angle 5 = \underline{55°}$ Because: $\triangle$ sum after finding $\angle 7$.

$m\angle 6 = \underline{55°}$ Because: diags of a Rhombus bisect the angles.

$m\angle 7 = \underline{35°}$ Because: diags of a Rhombus bisect the angles

b.) For rhombus *GHJK*, find $m\angle 1$

$\angle G + \angle K = 180°$ Con. int $\angle$s are suppl.

$\angle G + 128 = 180$

$\boxed{\angle G = 52°}$

$\angle 1 + 52 + 90 = 180$ $\triangle$ Sum

$\boxed{\angle 1 = 38°}$
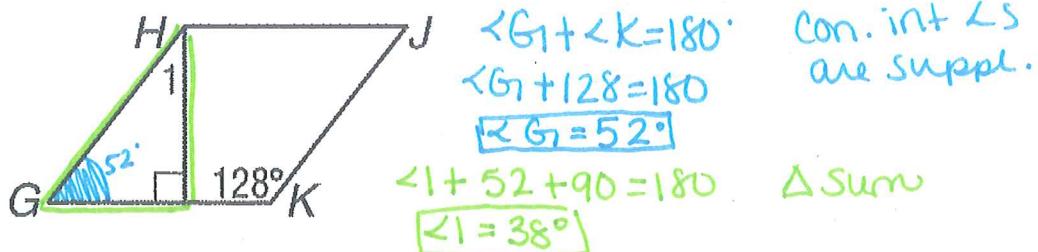
9. ABCD is a rectangle. If $m\angle 1 = 20$, find the $m\angle 2$, $m\angle 3$, $m\angle 4$, $m\angle 5$, and $m\angle 6$.
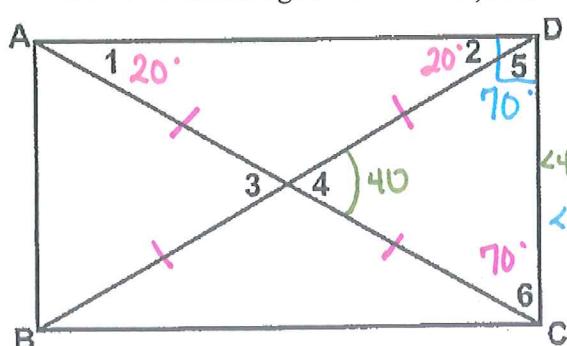
① $m\angle 2 = \underline{20°}$ Because: base $\angle$s of an isosceles $\triangle$ are $\cong$

⑤ $m\angle 3 = \underline{40°}$ Because: vertical $\angle$s are $\cong$

④ $\angle 4 + 70 + 70 = 180°$ $m\angle 4 = \underline{40°}$ Because: $\triangle$ sum

② $\angle 2 + \angle 5 = 90°$ $m\angle 5 = \underline{70°}$ Because: def of Rectangle: 4 Right $\angle$s

③ $m\angle 6 = \underline{70°}$ Because: base angles of Isosceles $\triangle$s are $\cong$

This is the order to find the $\angle$s in

3

10. For isosceles trapezoid *CDEF*, find *m∠F, m∠E, m∠D,* and *EF*.

$m\angle F =$ _____ $m\angle D =$ _____

$m\angle E =$ _____ $EF =$ _____
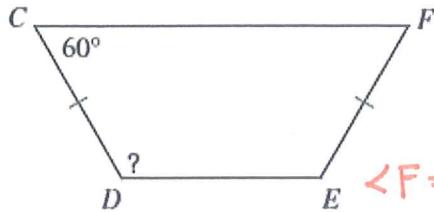
∠F = 60° base ∠s of isosceles trapezoids are ≅
∠D = 120° because con. int ∠s are suppl.
∠E = 120° because base ∠s of isosceles traps are ≅.
CD = EF legs are ≅ def of isosceles trapezoids.

11. Find all of the missing angles.

45°
v 135°
y
45
60°   75 z 68° w 37 100°
                        x
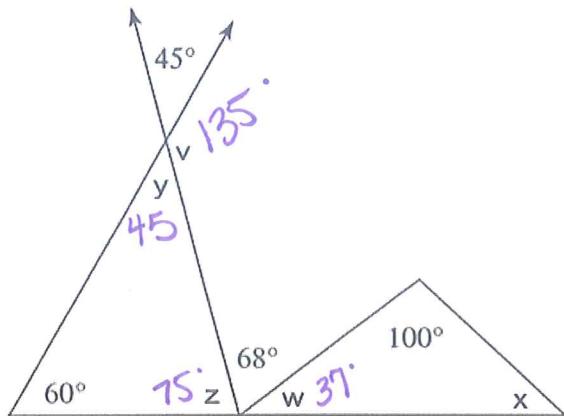
v = **135°**   w = **37°**   x = **43°**   y = **45°**   z = **75°**

12. LK is the midsegment of trapezoid HJNM. Find MN if HJ = 5 and LK = 25.

$KL = \frac{1}{2}(HJ + MN)$ $X = 45$

$25 = \frac{1}{2}(5 + x)$ MN = 45

$25 = 2.5 + .5x$

$\frac{22.5}{.5} = \frac{.5x}{.5}$

H — 5 — J
K — 25 — L
     x
M   N
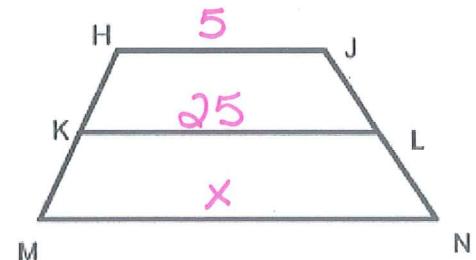
13. For isosceles trapezoid GHJK, find <1.

G 110° H

70°
     1
K   J

∠1 = 70°

4
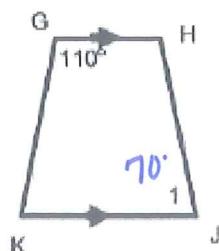
14. Given isosceles trapezoid ABCD, EF is the midsegment. Find EF, AD, and m<AEF if AB=10, CD = 20, AE = y + 5, FC = 2y – 10, and m<EFC =130

$$EF = \frac{1}{2}(10+20)$$

$AE = 15+5$
$AE = 20$
So $\boxed{AD = 40}$

$\boxed{AE = FC}$
$y+5 = 2y-10$
$5 = y-10$
$\boxed{15 = y}$

$<BFE \cong \angle AEF$
$50 = \angle AEF$

EF = __15__

AD = __40__

m<AEF = __50°__
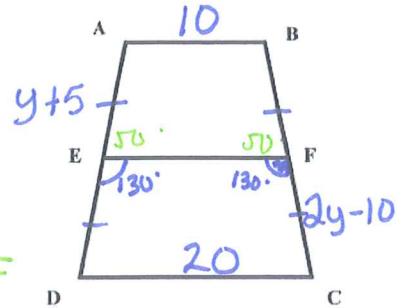
15. For isosceles trapezoid *MNOP*, find m<M, m<O, m<QNO and $m\angle MNQ$ if <P = 65°.
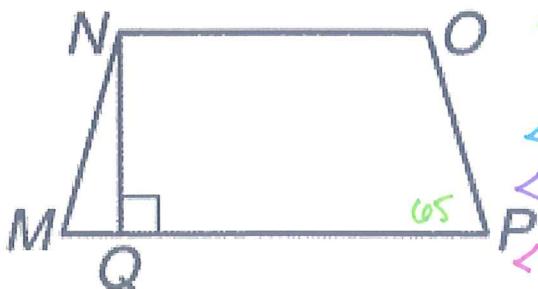
$\angle M = 65°$ base $\angle$s of isoscelese traps are $\cong$

$\angle O = 115°$ con. int $\angle$s of trap. are suppl.

$<QNO = 90°$ con. int $\angle$s are suppl.

$<MNQ = 25°$ $\triangle$ sum

16. **Write geometric statement along with the correct justification for parallelogram ABCD.**

a.) AB $\cong$ __CD__ because : op. sides of a para are $\cong$

b.) <ABC $\cong$ __<CDA__ because : op. $\angle$s of a para are $\cong$

c.) EA $\cong$ __EC__ because : diags of a para bisect each other

d.) BC // __AD__ because : Def of para: op. sides are //

e.) <BAD $\cong$ __<BCD__ because : op. $\angle$s of a para are $\cong$

f.) <BEA $\cong$ __<CED__ because : vertical $\angle$s are $\cong$

g.) <BCA $\cong$ __<DAC__ because : // lines form $\cong$ alt. int. $\angle$s.

h.) <BCD + < __ADC__ = 180 because : con. int $\angle$s of a para are suppl.
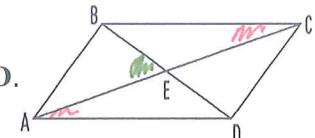
17. Use rhombus PLAN to write the correct geometric statement (if needed) and justification.

a.) AL ≅ PL because : def of rhombus: 4 ≅ sides.
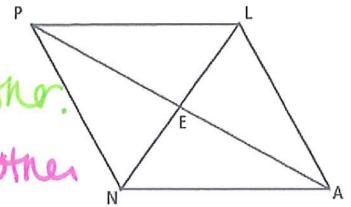
b.) <NEA = 90 because : diags of a Rhombus are ⊥ to each other.

c.) EA ≅ **PE** because : diags of a Rhombus bisect each other

d.) NA // **PL** because : a Rhombus is a Parallelogram: op. sides are //

e.) <NPE ≅ **<LPE** because : diags of a Rhombus bisect the angles.

f.) <PLA ≅ **<PNA** because : op. <s of a Rhombus are ≅

g.) <LNA ≅ **<PNL** because : diags of a Rhombus bisect the <s.

h.) <LEA = 90 because : diags of a Rhombus are ⊥

18. Use rectangle RECT to write the correct geometric statement (if needed) and justification.

a.) RC ≅ TE because : diags of a Rect. are ≅
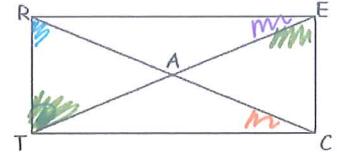
b.) <TCE = 90 because : def of Rect: all 4 Right <s

c.) EA ≅ **AT** because : diags of a Rect. bisect each other (there are 4 segs. that EA is ≅ to!)

d.) RE // **TC** because : a rectangle is a para, op. sides are //.

e.) <TRA ≅ <RTA because : base <s of isosceles △s are ≅

f.) <RAE ≅ **<CTE** because : // lines form ≅ alt. int. <s.

g.) <RTE ≅ <TES because : // lines form ≅ alt. int. <s

h.) <TCR + **<ECR** = 90 because : def of Rectangle : all 4 Right <s.

19.   ABCD is a quadrilateral with the following information. Determine if ABCD is a parallelogram, rhombus, rectangle and/or square.

Slope AB= -1/5   Slope DC = -1/5   Slope DA = 3/2   Slope BC = 3/2

$AB = \sqrt{26}$ $DC = \sqrt{26}$ $DA = \sqrt{13}$ $BC = \sqrt{13}$

ABCD __IS__ a parallelogram because __op. sides are parallel (same slope)__

ABCD __IS NOT__ a rhombus because __all sides are not ≅__

ABCD __IS NOT__ a rectangle because __it doesn't have 4 right ∠s (⊥ slopes)__

ABCD __IS NOT__ a square because __it does not have 4 ≅ sides or right ∠s__

     (is or is not)

20.   ABCD is a quadrilateral with the following information. Determine if ABCD is a parallelogram, rhombus, rectangle and/or square.

Slope AB= -3   Slope DC = -3   Slope DA = 1/3   Slope BC = 1/3

$AB = 2\sqrt{10}$ $DC = 2\sqrt{10}$ $DA = 2\sqrt{10}$ $BC = 2\sqrt{10}$

ABCD __IS__ a parallelogram because __op. sides are parallel (same slope)__

ABCD __IS__ a rhombus because __all 4 sides are ≅ (= distance)__

ABCD __IS__ a rectangle because __it has 4 right ∠s (⊥ slopes)__

ABCD __IS__ a square because __it has 4 ≅ sides and 4 Right ∠s__
     (is or is not)   __(= distance)   (⊥ slopes)__

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21.   ABCD is a quadrilateral with the following information. Determine if ABCD is a parallelogram, rhombus, rectangle and/or square.

Slope AB= 4/3   Slope DC = 4/3   Slope DA = undefined   Slope BC = undefined

AB =5   DC =5   DA =5   BC =5

ABCD __IS__ a parallelogram because _op. sides are parallel (same Slope)_

ABCD __IS__ a rhombus because _it has 4 ≅ sides (= distance)_

ABCD __IS NOT__ a rectangle because _it does not have 4 right ∠'s (⊥ slopes)_

ABCD __IS NOT__ a square because _it has 4 ≅ sides but not 4 Right ∠s (= distance)_

(is or is not)

22.   ABCD is a quadrilateral with the following information. Determine if ABCD is a parallelogram, rhombus, rectangle and/or square.

Slope AB= -2   Slope DC = -2   Slope DA = 1/2   Slope BC = 1/2

AB =$2\sqrt{13}$ DC =$2\sqrt{13}$ DA =$2\sqrt{5}$ BC =$2\sqrt{5}$

ABCD __IS__ a parallelogram because _op. sides are parallel (same Slope)_

ABCD __IS NOT__ a rhombus because _all sides are not ≅ (≠ distance)_

ABCD __IS__ a rectangle because _it has all Right ∠s (⊥ slopes)_

ABCD __IS NOT__ a square because _it only has 4 right ∠ but not ≅ sides_

(is or is not)

19. Classify *QRST* with vertices Q(-5,7), R(-3, 4), S(3, 8), and T(1, 11). SHOW ALL WORK!!!! Show all distances, all slopes, find the ~~area~~ and perimeter of the figure.
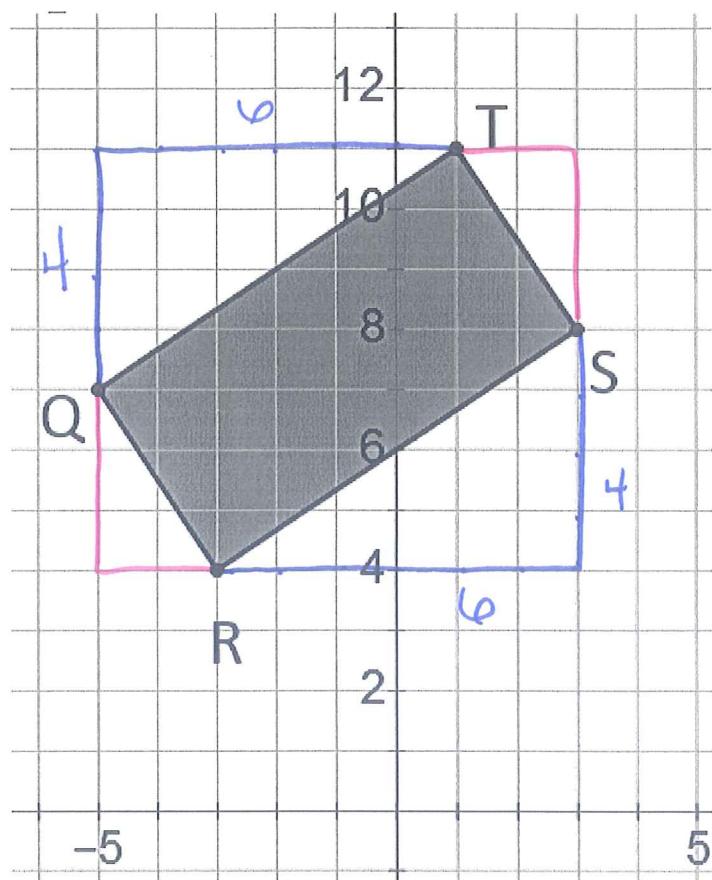
Slope QT $= \frac{4}{6} = \frac{2}{3}$ ⎫ QT // RS

Slope RS $= \frac{4}{6} = \frac{2}{3}$ ⎭

Slope TS $= -\frac{3}{2}$ ⎫ TS // QR

Slope QR $= -\frac{3}{2}$ ⎭

※ So slopes are ‖ !

But are they ⊥? ※ means do we have op. recip slopes?

$\frac{2}{3}$ and $-\frac{3}{2}$ are op. recips !!

※ so we have Right ∠s !

QT: $4^2 + 6^2 = QT^2$

$\boxed{\sqrt{52} = QT}$

RS: $4^2 + 6^2 = RS^2$

$\boxed{\sqrt{52} = RS}$

QT ≅ RS ← but these are not ≅ to eachother → QR ≅ TS

QR: $3^2 + 2^2 = QR^2$

$\boxed{\sqrt{13} = QR}$

TS: $3^2 + 2^2 = TS^2$

$\boxed{\sqrt{13} = TS}$

QRST __IS__ a parallelogram because __op. sides are parallel__

QRST __IS NOT__ a rhombus because __all 4 sides are not = .__

QRST __IS__ a rectangle because __it has 4 right angles (⊥ slopes)__

QRST __IS NOT__ a square because __it has 4 right ∠s but not 4 ≅ sides.__

$\boxed{P = 2\sqrt{52} + 2\sqrt{13}}$

20. Classify *ABCD* SHOW ALL WORK!!!! Show all distances, all slopes, find the area and perimeter of the figure.
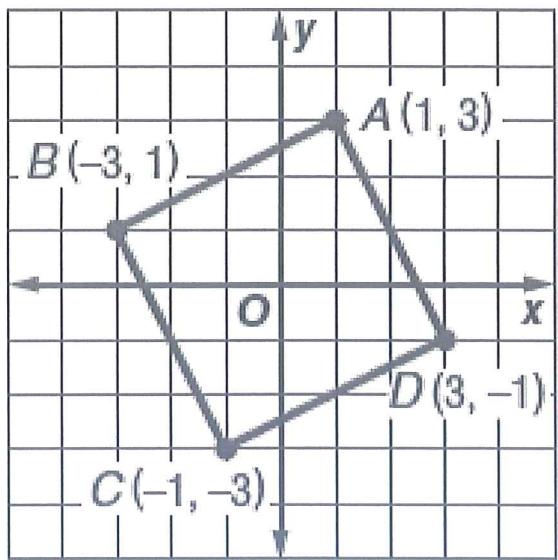
Slope $BC = \dfrac{-4}{2} = -2$

Slope $AD = \dfrac{-4}{2} = -2$

Slope $AB = \dfrac{2}{4} = \dfrac{1}{2}$

Slope $CD = \dfrac{2}{4} = \dfrac{1}{2}$

$AB = 2\sqrt{5}$, $BC = 2\sqrt{5}$

$AD = 2\sqrt{5}$ $CD = 2\sqrt{5}$

↑

Students must show work for distance.

ABCD __IS__ a parallelogram because __op. sides are // (same slope)__

ABCD __IS__ a rhombus because __all 4 sides are ≅ (= distance)__

ABCD __IS__ a rectangle because __all 4 right ∠s (⊥ slopes)__

ABCD __IS__ a square because __all 4 sides ≅ and all 4 right ∠s (= distance) (⊥ slopes)__

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