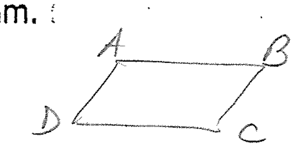
# Review Packet #1

Geometry (H)

Name: KEY

Review of 5.1 - 5.5

1. Find the value of x and y that makes ABCD a parallelogram.




AB = 6x + 30, BC = 2x – 5, CD = 2y – 10, AD = y – 35

$AB = DC$    $AD = BC$

$\boxed{6x+30 = 2y-10}$    $\boxed{y-35 = 2x-5}$

$6x - 2y = -40$

$2(-2x + y = 30)$

$-4x + 2y = 60$

$6x - 2y = -40$

$2x = 20 \rightarrow x = 10$

$y = 20 - 5 + 35$

$y = 50$

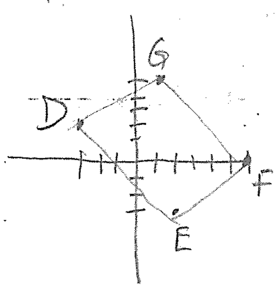
ck

$AB = 90$    $AD = 15$

$DC = 90$    $BC = 15$

$AB \stackrel{\checkmark}{=} DC$    $AD \stackrel{\checkmark}{=} BC$

2. Determine whether quadrilateral DEFG with vertices D(-3,2), E(2,-3), F(6,0) and G(1,5) is a parallelogram




$m_{\overline{DG}} = \frac{2-5}{-3-1} = \frac{-3}{-4} = \frac{3}{4}$

$m_{\overline{EF}} = \frac{-3-0}{2-6} = \frac{-3}{-4} = \frac{3}{4}$

$\overline{DG} \parallel \overline{EF}$

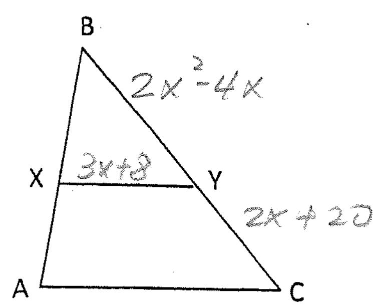
$m_{\overline{DE}} = \frac{2+3}{-3-2} = \frac{5}{-5} = -1$

$m_{\overline{GF}} = \frac{0-5}{6-1} = \frac{-5}{5} = -1$

$\overline{DE} \parallel \overline{GF}$

Yes, DEFG is a ▱.

3. $\overline{XY}$ is the midsegment of $\triangle ABC$.
BY = $2x^2 - 4x$; YC = 2x + 20; XY = 3x + 8




Find AC.

$2x^2 - 4x = 2x + 20$

$2x^2 - 6x - 20 = 0$

$x^2 - 3x - 10 = 0$

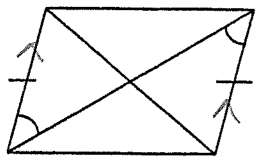
$(x-5)(x+2) = 0$

| $x = 5$ | $x = -2$ |
|---|---|
| $BY = 30$ | $BY = 16$ (8+8) |
| $YC = 30$ | $YC = 16$ |
| $XY = 23$ | $XY = 2$ |
| $AC = 46$ | $AC = 4$ |

AC = 46 or 4

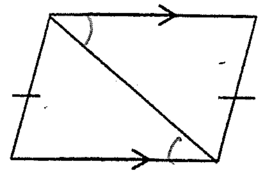
4. Determine whether the following quadrilaterals are parallelograms. Justify your answers. Include a definitions and/or theorem as part of your explanation.

a.



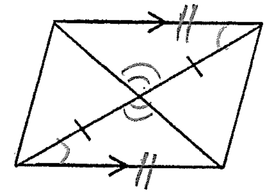
Yes, a ▱.
One pair of opp sides are both parallel and ≅.

b.



Not enough information.

c.



Yes, a ▱
One pair of opp sides are both ∥ & ≅.

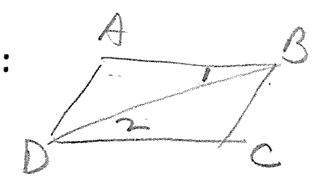
5. Prove the following theorem. Provide a given, prove, diagram and flow proof.

**If a quadrilateral is a parallelogram, then the opposite sides are congruent.**

Given: ▱ABCD

Prove: $\overline{AB} \cong \overline{DC}$, $\overline{AD} \cong \overline{BC}$

Diagram:



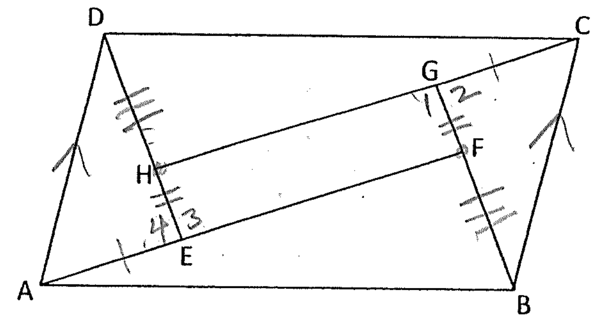

① Draw $\overline{BD}$.
② ▱ABCD → ③ $\overline{AB} \parallel \overline{DC}$ → ④ $\angle 1 \cong \angle 2$
⑤ $\overline{BD} \cong \overline{BD}$
② ▱ABCD → ⑥ $\angle A \cong \angle C$
④, ⑤, ⑥ → ⑦ $\triangle ABD \cong \triangle CDB$ → ⑧ $\overline{AB} \cong \overline{DC}$, $\overline{AD} \cong \overline{BC}$

① 2 points determine a line.
② Given
③ In a ▱ → opp sides ∥.
④ 2 ∥ lines → alt. int. ∠s ≅.
⑤ Reflexive property
⑥ In a ▱ → opp ∠s ≅.
⑦ AAS ≅ AAS
⑧ CPCTC

6. Write a flow proof for the following.

Given: EFGH is a parallelogram
$\overline{HD} \cong \overline{FB}$; $\overline{AE} \cong \overline{CG}$; $\overline{DA} \parallel \overline{BC}$

Prove: ABCD is a parallelogram




1 ▱ EFGH → 2 $\angle 1 \cong \angle 3$

3 $\angle 3$ & $\angle 4$ linear pair → 4 $\angle 3$ supp $\angle 4$

$\angle 1$ & $\angle 2$ linear pair → $\angle 1$ supp $\angle 2$

→ 5 $\angle 2 \cong \angle 4$

→ 6 $HE \cong GF$
7 $HD \cong FB$

→ 8 $HE + HD = GF + FB$

9 $DE = HD + HE$
$BG = FB + GF$

→ 10 $\overline{DE} \cong \overline{BG}$

11 $\overline{AE} \cong \overline{CG}$

→ 12 $\triangle AED \cong \triangle CGB$

→ 13 $\overline{AD} \cong \overline{BC}$
14 $\overline{DA} \parallel \overline{BC}$

→ 15 ABCD is a ▱.

1 Given
2

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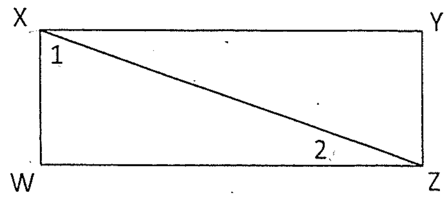
Chapter 5 – Proof practice

Write a flow proof for each of the following.

1. Given: ▱ WXYZ; ∠1 complementary ∠2

   Prove: WXYZ is a rectangle




① ∡1 comp. ∡2 → ② m∡1 + m∡2 = 90
③ m∡1 + m∡2 + m∡W = 180 } → ④ 90 + m∡W = 180

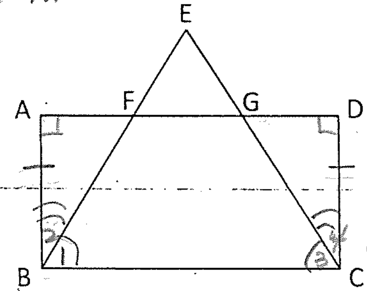
→ ⑤ m∡W = 90 → ⑥ ∡W is Rt.
⑦ ▱ WXYZ } → ⑧ WXYZ is a rect.

Corollary: The acute ∡s of a Rt. Δ are compl. → Rt. Δ must be given.

① Given
② Def. compl. ∡s.
③ Sum of ∡s of Δ = 180
④ Substitution
⑤ Subtraction
⑥ Def. Rt. ∡
⑦ Given
⑧ ▱ with 1 Rt ∡ → a rectangle.

2. Given: Rect ABCD; $\overline{BE} \cong \overline{CE}$

   Prove: $\overline{AF} \cong \overline{DG}$ (Show ΔABF ≅ ΔDCG by ASA)




✳ complementary Thm can replace these

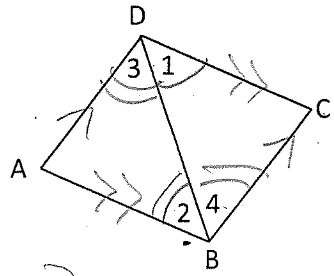
① $\overline{BE} \cong \overline{CE}$ → ② ∡1 ≅ ∡3
③ Rect. ABCD → ④ ∡A, ∡D, ∡ABC, ∡BCD are Rt. ∡s → ⑤ m∡ABC = m∡BCD
⑥ m∡ABC = m∡1 + m∡2
m∡BCD = m∡3 + m∡4 } → ⑦ m∡1 + m∡2 = m∡3 + m∡4

⑧ ∡2 ≅ ∡4
⑨ $\overline{AB} \cong \overline{CD}$
⑩ ∡A ≅ ∡D } → ⑪ ΔABF ≅ ΔDCG → ⑫ $\overline{AF} \cong \overline{DG}$

① Given
② 2 sides of Δ ≅ → opp ∡s ≅.
③ Given
④ Rect has 4 Rt ∡s.
⑤ All Rt. ∡s ≅.
⑥ Angle Add. Post.
⑦ Substitution
⑧ Subtraction
⑨ Rect → opp sides ≅.
⑩ All Rt. ∡s ≅.
⑪ ASA ≅ ASA
⑫ CPCTC

3. Given: $\angle 1 \cong \angle 2$, $\angle 3 \cong \angle 4$, $\angle 2 \cong \angle 3$

Prove: ABCD is a rhombus




① $\angle 1 \cong \angle 2$ → ② $\overline{DC} \parallel \overline{AB}$
③ $\angle 3 \cong \angle 4$ → ④ $\overline{AD} \parallel \overline{BC}$
→ ⑤ ABCD is ▱

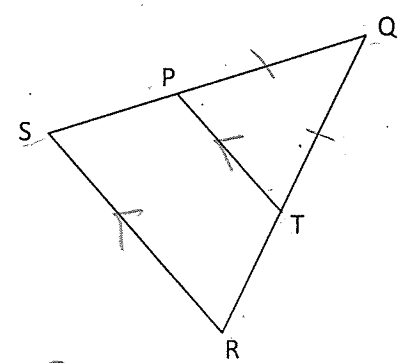
⑥ $\angle 2 \cong \angle 3$ → ⑦ $\overline{AD} \cong \overline{AB}$

→ ⑧ ABCD is a rhombus.

① Given
② Alt. int. ∡s ≅ → 2 ∥ lines.
③ Given
④ Same as #2
⑤ Opp sides ∥ → ▱
⑥ Given
⑦ 2 ∡s ≅ → sides opp ≅.
⑧ ▱ with one pr. consecutive sides ≅ → rhombus.

4. Given: $\triangle SQR$ isosceles w/ vertex $\angle Q$
$\triangle PQT$ isosceles w/ vertex $\angle Q$
$\overline{TP} \parallel \overline{RS}$

Prove: RSPT is an isosceles trapezoid




① Isos. $\triangle SQR$ → ② SQ = RQ
③ SQ = SP + PQ, RQ = RT + TQ
→ ④ SP + PQ = RT + TQ
⑤ Isos. $\triangle PQT$ → ⑥ PQ = QT
→ ⑦ $\overline{SP} \cong \overline{TR}$
⑧ $\overline{TP} \parallel \overline{RS}$
→ ⑨ TRAP RSPT
⑩ $\overline{SP} \cong \overline{TR}$
→ ⑪ Isos. trap RSPT

① Given
② Isos $\triangle$ → opp sides ≅.
③ Seg. Add. Post.
④ Substitution
⑤ Given
⑥ Isos $\triangle$ → opp sides ≅.
⑦ Subtraction
⑧ Given
⑨ Def of trapezoid
⑩ refer to #7.
⑪ Def. isos. trap.