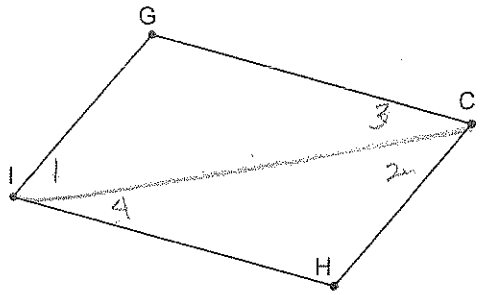
Proofs 4!!!! ☺☺☺☺ Name_____

1. If one of the diagonals of a parallelogram is drawn, then the parallelogram is divided into two congruent triangles.



① □GCHI parallelogram

② Draw IC — 2 pts determine line

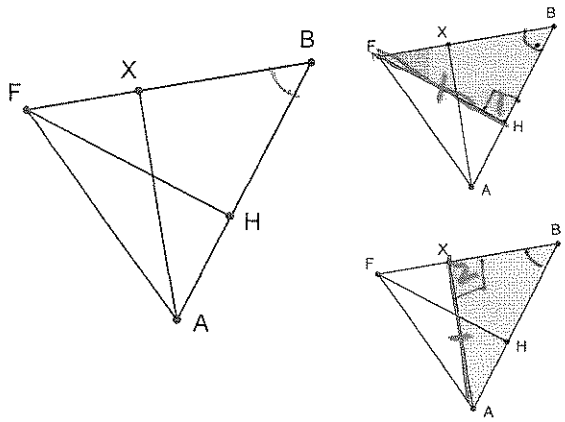
③ IG = HC, GC = IH — Opposite Sides of parallelogram =

④ ∠G = ∠H — Opposite Angles of Parallelogram =

⑤ △IGC ≅ △CHI — SAS

NOTE: ASA, AAS, & SSS work Too

2. Given: AX = FH
$\overline{AX} \perp \overline{FB}$
$\overline{FH} \perp \overline{AB}$
Prove AB = FB
Hint: look at triangles BFH and BAX



① _____ Given

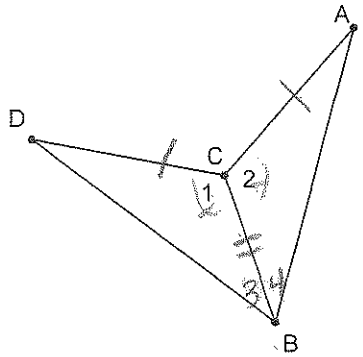
② ∠1 = ∠2 — ⊥ lines form rt ∠'s which are =

③ ∠B = ∠B — Reflexive

④ △BHF ≅ △BXA — AAS

⑤ AB = FB — If △'s ≅, corresponding sides =

3. Given: ∠1 ≅ ∠2
AC = DC
Prove: $\overline{BC}$ bisects ∠ ABD



① _____ Given

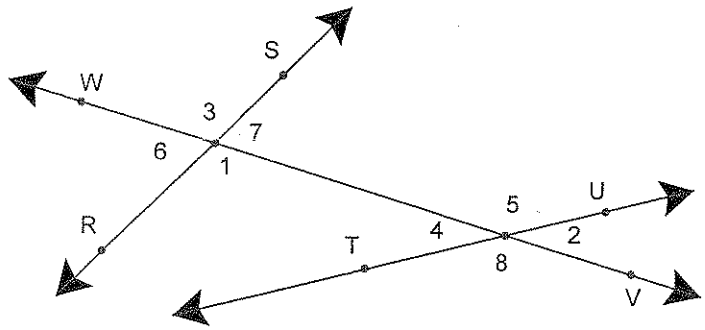
② CB = CB — Reflexive

③ △DCB ≅ △ACB — SAS

④ ∠3 = ∠4 — If △'s ≅, corresponding angles =

⑤ $\overline{BC}$ Bisects ∠ABD — Bisector ⊥ angle into 2 = parts

4. Complete the following:



Line $\overleftrightarrow{WV}$ is a transversal because it intersects two lines in two distinct points.

Corresponding Angles

∠ 6 and ∠4

∠ 2 and ∠7

∠ 1 and ∠8

∠ 5 and ∠3

Interior Angles

∠7 and ∠5

∠1 and ∠4

Alternate Interior Angles

∠7 and ∠4

∠1 and ∠5

Alternate Exterior Angles

∠3 and ∠8

∠6 and ∠2

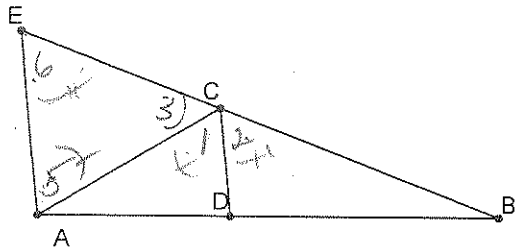
5. . Given $\overline{CD}$ bisects ∠ACB

$\overline{EA} \parallel \overline{CD}$

Find: m∠CEA and m∠EAC if

∠1 = m∠ACD = $5x^2 + 3x$

∠6 = m∠CEA = $4x^2 + x + 15$



$5x^2 + 3x = 4x^2 + x + 15$

$x^2 + 2x - 15 = 0$

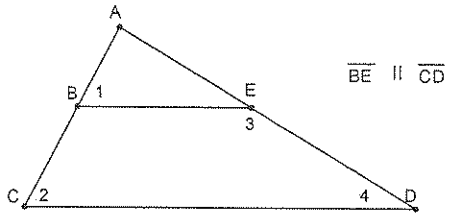
$(x+5)(x-3) = 0$

$x = -5$ $x = 3$

NOT FEASIBLE → 10 | 54°

54° | 10

6.



$\overline{BE} \parallel \overline{CD}$

74° m∠ 1 = 18x – 5y + 27

74° m∠ 2 = 6(3y + 2x) – 64

124 m∠ 3 = 33y – 3(2x + y) – 2

56° m∠ 4 = 5 – 3(2x – 5y)

$18x - 5y + 27 = 18y + 12x - 64$

$6x - 23y = -91$

$33y - 6x - 3y - 2 + 5 - 6x + 15y = 180$

$-12x + 45y = 177$

$12x - 46y = -182$

$y = 5$ $x = 4$