★ Solutions ★

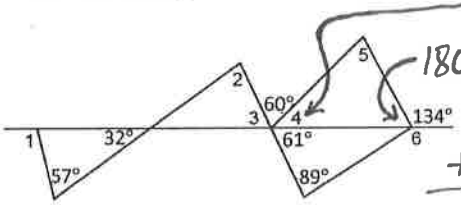
CHAPTER 4 REVIEW

name_____hr_____

GEOMETRY – E

1. Find the m∠5.

$m\angle 4 = 180 - 60 - 61 = 59°$

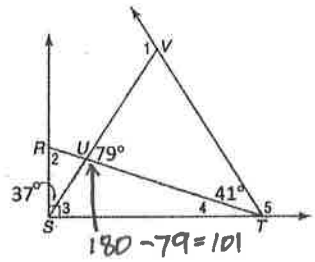


$180 - 134 = 46°$

$59 + 46 = 105$

$m\angle 5 = 180 - 105 = \boxed{75°}$

2. Find the m∠4.



$180 - 79 = 101$

$m\angle 3 = 90 - 37 = 53$

$101 + 53 = 154$

$180 - 154 = \boxed{26°} = m\angle 4$

3. The variable expressions represent the angle measures of a triangle. Find the measure of each angle and then classify the triangle by its angles.

$m\angle A = 2x$

$m\angle B = (3x - 10)$

$m\angle C = (110 - x)$

$2x + 3x - 10 + 110 - x = 180$

$4x + 100 = 180$

$4x = 80$

$x = 20$

$2(20) = 40$

$3(20) - 10 = 50$

$110 - 20 = 90$, so right △

4. Suppose the ratio of the angle measures of a triangle is 1:3:5. Find the measure of the largest angle.

$1x + 3x + 5x = 180$

$\frac{9x}{9} = \frac{180}{9}$

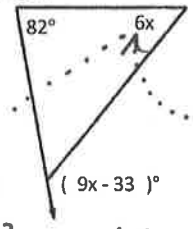
$x = 20$

$1 \cdot 20 \quad 3 \cdot 20 \quad 5 \cdot 20$

$20 \quad 60 \quad \boxed{100°}$

5. Find the value of x.

exterior ∠ thm.



$6x + 82 = 9x - 33$

$-6x \qquad -6x$

$82 = 3x - 33$

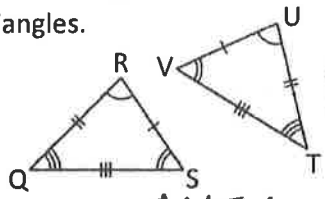
$+33 \qquad +33$

$\frac{115}{3} = \frac{3x}{3}$

$38.3 = x$

but, $6(38.3) = 229.8$, and a △ can't have a 229.8° ∠, so no solution.

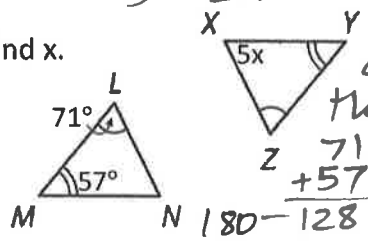
6. Write a congruence statement for the triangles.



match the ∠s that have the same mark.

△SQR ≅ △VTU

7. Find x.



3rd ∠s thm. since ∠s L & M are ≅ to ∠s Z & Y, then ∠N ≅ ∠X.

$71 + 57 = 128$

$180 - 128 = 52$

$\frac{52}{5} = \frac{5x}{5}$

$x = \boxed{10.4}$

8. Given that ΔXYZ ≅ ΔRST, find the values of a and b.

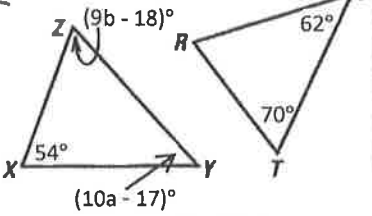
based on this...

∠X ≅ ∠R

∠Y ≅ ∠S

∠Z ≅ ∠T

so...



$10a - 17 = 62$

$+17 \quad +17$

$\frac{10a}{10} = \frac{79}{10}$

$\boxed{a = 7.9}$

and: $9b - 18 = 70$

$+18 \quad +18$

$9b = 88$

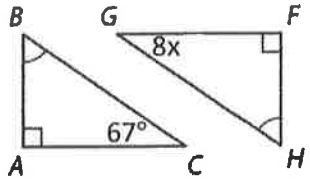
$\boxed{b = 9.8}$

oops... I made a mistake...

$62 + 70 + 54 = 186 \neq 180$?!

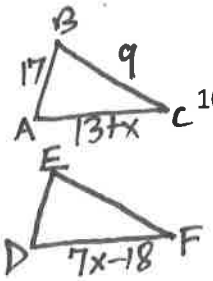
Third ∠s Thm: since ∠B & ∠A are ≅ to ∠H & ∠F, then ∠C ≅ ∠G

9. Find x.



$\frac{67}{8} = \frac{8x}{8}$

$\boxed{x = 8.4}$



10. Draw and label a figure to represent the congruent triangles. Then find x.
ΔABC ≅ ΔDEF, AB=17, BC=9, AC=13+x, DF=7x-18.

$\overline{AC} \cong \overline{DF}$

so... $13 + x = 7x - 18$
$-x \quad -x$
$13 = 6x - 18$

$\frac{31}{6} = \frac{6x}{6}$

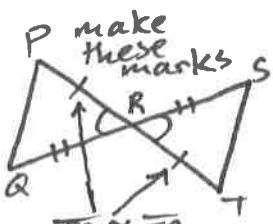
$\boxed{5.2 = x}$

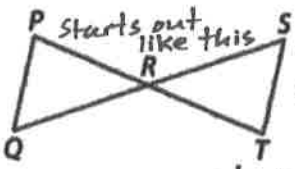
11. State the congruence postulate or theorem you would use to prove the triangles congruent.

R is the midpoint of $\overline{QS}$ and $\overline{PT}$.

answer $\boxed{SAS}$

2 sides & the included ∠ of 1 Δ are ≅ the correspond. sides & ∠ of the other Δ.

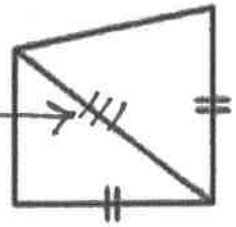




$\overline{PR} \cong \overline{TR}$ & $\overline{QR} \cong \overline{SR}$ by midpoint thm.

also, mark the vertical ∠s ∠PRQ ≅ ∠TRS

12. State the congruence postulate or theorem you would use to prove the triangles congruent.



mark this by the reflexive property

no such thing as a SS thm...

so not enough info.

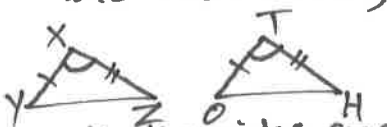
[SOLUTIONS]

CHAPTER 4 REVIEW

name_____hr_____

GEOMETRY – E (part 2)

13. Given ∠X ≅ ∠T, what sides must you know to be congruent to prove ⊿YXC ≅ ⊿OTH by SAS? make a diagram, and mark the given ∠s X & T.



mark the sides surrounding the ∠.
so... for SAS: $\overline{XY} \cong \overline{TO}$ & $\overline{XZ} \cong \overline{TH}$.

14. Which postulate can be used to prove the triangles congruent? *(Without using the isosceles triangle theorem.)*

mark the shared side

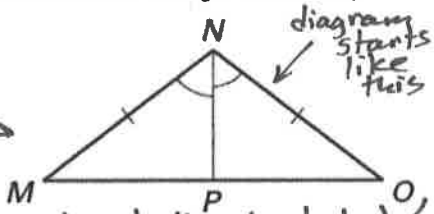


diagram starts like this

2 sides & the included ∠ of 1 △ are ≅ to the corresp 2 sides and included ∠ of the other △.
Side-Angle-Side
SAS

15. Name the theorem or postulate that justifies the congruence. ΔABD ≅ ΔCDB

mark the shared side

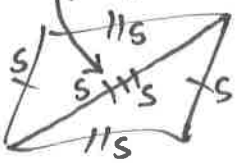
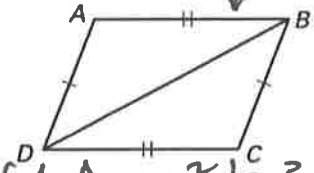
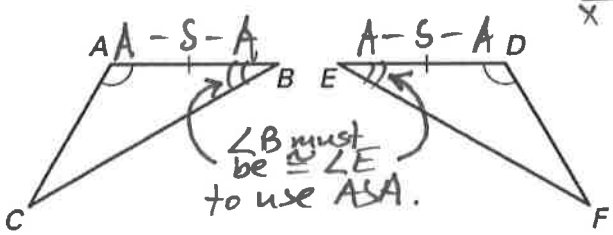


diagram starts like this



All 3 sides of 1 △ are ≅ to 3 sides of the other △.
side-side-side
SSS

16. What congruence statement is needed to use ASA to prove ⊿ABC ≅ ⊿DEF?



∠B must be ≅ ∠E to use ASA.

17. Which postulate can be used to prove the triangles congruent? *(Without using the third angles theorem.)*

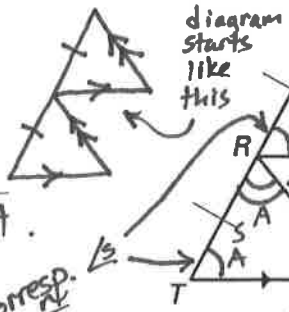


diagram starts like this

corresp. ∠s are ≅ because $\overline{QS} \parallel \overline{RU}$.

∠s

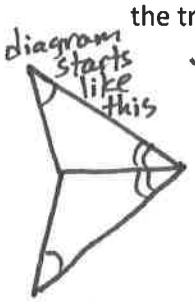
corresp. ∠s are ≅ because $\overline{RS} \parallel \overline{TU}$

2 ∠s & the included side of 1 △ are ≅ to 2 ∠s and included side of the other △.

ASA

18. Which postulate can be used to prove the triangles congruent?

diagram starts like this



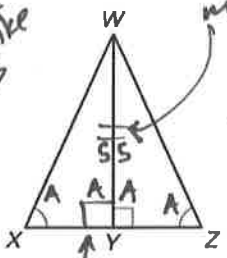
mark shared side

side IU is not included between the 2 ∠s

AAS

19. Which postulate can be used to prove the triangles congruent? *(Without using the converse of the isosceles triangle theorem.)*

diagram starts like this



mark the shared side

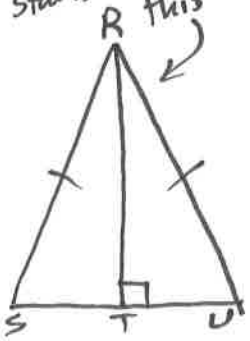
mark the other right ∠.

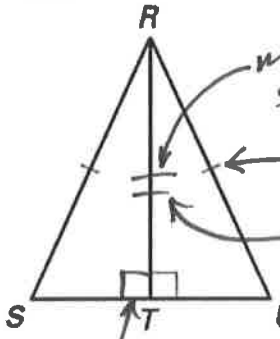
$\overline{WY}$ is not included between ∠X and ∠WYX.

AAS

20. Which postulate can be used to prove the triangles congruent? *(Without using the isosceles triangle theorem.)*

diagram starts like this





mark the shared side

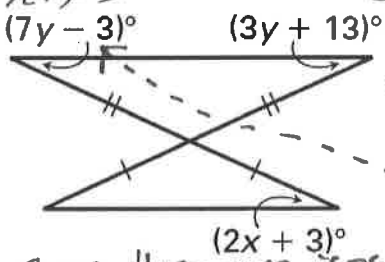
hypotenuse

leg

$\boxed{HL}$

mark the other right ∠.

21. What is the value of x?



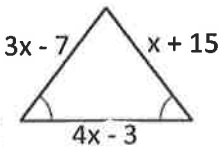
$25° = 7(4) - 3$

$7y - 3 = 3y + 13$
$-3y \quad -3y$
$4y - 3 = 13$
$+3 \quad +3$
$\frac{4y}{4} = \frac{16}{4}$
$\boxed{y = 4}$

since they are isos. △s with vertical vertex ∠s, all 4 base ∠s must be ≅.

$2x + 3 = 25$
$2x = 22$
$\boxed{x = 11}$

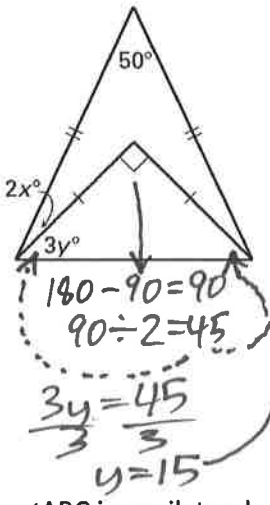
22. What is the value of x?



since there are 2 ≅ ∠s, then the sides opposite from them are ≅. so...

$3x - 7 = x + 15$
$2x - 7 = 15$
$2x = 22$
$\boxed{x = 11}$

23. Find the value of x.



$180 - 90 = 90$
$90 \div 2 = 45$

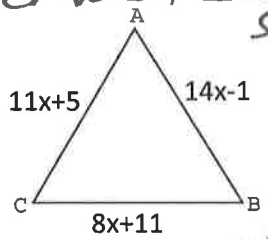
$\frac{3y}{3} = \frac{45}{3}$
$y = 15$

if y is 15, then $3y = 45°$, and the base ∠s of the larger △ become $2x + 45$ each.

$50 + 2x + 45 + 2x + 45 = 180$
$4x + 140 = 180$
$4x = 40$
$\boxed{x = 10}$

24. △ABC is equilateral. Find x.

all sides ≅, so it doesn't matter what 2 sides you set equal.

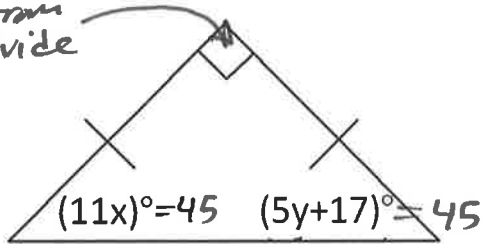


$11x + 5 = 14x - 1$
$5 = 3x - 1$
$6 = 3x$
$2 = x$

25. Find the values of the variables.

subtract from 180 & divide by 2.

$180 - 90 \div 2 = 45$



$\frac{11x}{11} = \frac{45}{11}$
$\boxed{x = 4.1}$

$5y + 17 = 45$
$-17 \quad -17$
$\frac{5y}{5} = \frac{28}{5}$
$y = \boxed{5.6}$