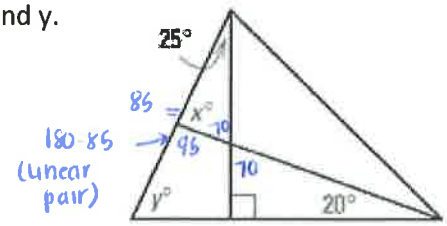
Geometry H
Unit 3 Extra Practice

Name : Key
Date : _____ Period : ____

1. Given the triangle blow, please solve for x and y.

$x+70+25=180$

$x=85$

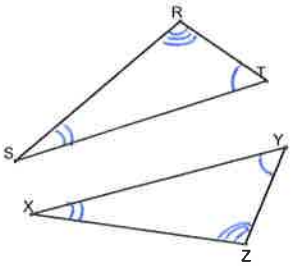


$y+95+20=180$

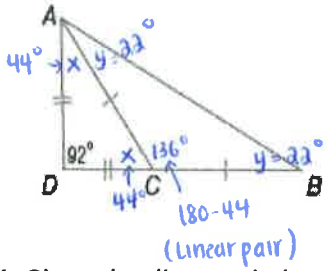
$y=65$

2. Given $\Delta TSR \cong \Delta YXZ$,

$\angle X \cong$ S
$\angle R \cong$ Z
$\angle Y \cong$ T



3. Given the diagram below and m∠ADC = 92°, please find $m\angle DAB$.



$2x+92=180$

$2x=88$

$x=44$

$2y+136=180$

$2y=44$

$y=22$

$m\angle DAB=44+22$

$m\angle DAB=66°$

4. Given the diagram below, please solve for x.

$60+y+60+y+2y=180$

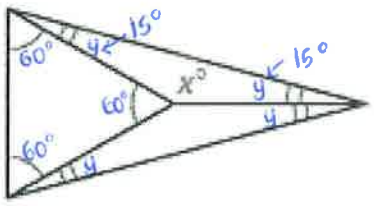
$4y+120=180$

$4y=60$

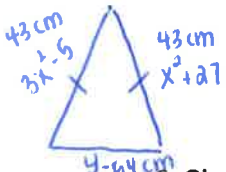
$y=15$

$x+15+15=180$

$x=150$



5. The lengths of two legs of an isosceles triangle are $(3x^2-5)$ cm and (x^2+27) cm. The perimeter of the triangle is 150 cm. Please find the length of the base.



$3x^2-5=x^2+27$

$2x^2-5=27$

$2x^2=32$

$x^2=16$

$x=\pm 4$

$3(4)^2-5=43$ cm

$(4)^2+27=43$ cm

$y+43+43=150$

$y=64$

Base = 64 cm

6. Given the diagram below, please solve for x and y.

Sm Δ: $4x+y=180$

Outer Δ: $65+111+x+11+y=180$

$x+y=93$

$4x+y=180$

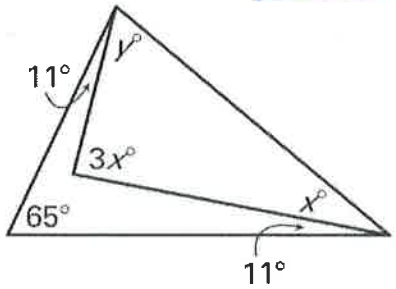
$-1(x+y=93)$ ⇒ $-x-y=-93$

$3x=87$

$x=29$

$29+y=93$

$y=64$



7. In ABC, the measures of the angles are $m\angle A = (3x - 17)°$, $m\angle B = (x + 40)°$ and $m\angle C = (2x - 5)°$. Please classify the triangle by its side lengths and angle measures.

$3x-17+x+40+2x-5 = 180$

$6x+18 = 180$

$6x = 162$

$x = 27$

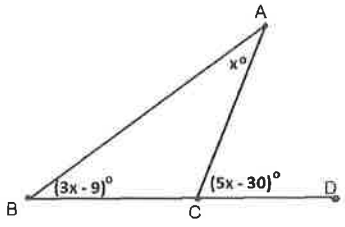
$m\angle A = 3(27)-17 = 64°$

$m\angle B = 27+40 = 67°$

$m\angle C = 2(27)-5 = 49°$

Scalene acute

8. Given the diagram below, please find $m\angle ACD$.



$5x-30 = x+3x-9$

$5x-30 = 4x-9$

$x-30 = -9$

$x = 21$

$m\angle ACD = 5(21)-30$

$m\angle ACD = 75°$

9. Given the diagram below, please find $m\angle JLK$.

$2x+10+3x-55 = 180$

$5x-45 = 180$

$5x = 225$

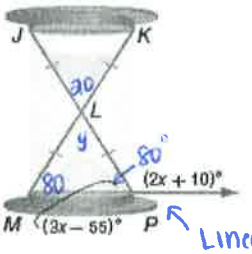
$x = 45$

$y+80+80 = 180$

$y = 20°$

$m\angle JLK = 20°$

b/c of VAT



Linear Pair

10. In ΔEFG, $m\angle F = 3(m\angle G)°$ and $m\angle E = (m\angle F - 30)°$. Please find the measure of each angle.

$m\angle G = x$ $m\angle E = 3x-30$

$m\angle F = 3x$

$x+3x+3x-30 = 180$

$7x-30 = 180$

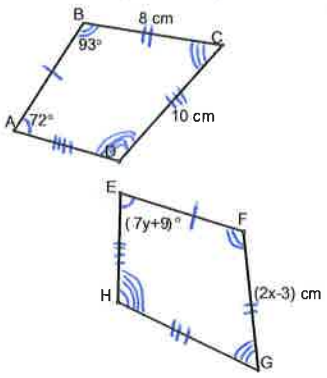
$7x = 210$ $\Rightarrow x = 30$

$m\angle G = 30°$

$m\angle F = 90°$

$m\angle E = 60°$

11. Given ABCD ≅ EFGH, please find x and y.



$\angle A \cong \angle E$ so $72 = 7y+9$

$63 = 7y$

$y = 9$

$\overline{BC} \cong \overline{FG}$ so $8 = 2x-3$

$11 = 2x$

$x = 5.5$

12. Please classify ΔABC by its sides and determine if the triangle is a right triangle. A(2, 3), B(6, 3), C(2, 7).

$AB = \sqrt{(6-2)^2+(3-3)^2} = \sqrt{(4)^2} = \sqrt{16} = 4$

$BC = \sqrt{(2-6)^2+(7-3)^2} = \sqrt{(-4)^2+(4)^2} = \sqrt{16+16} = \sqrt{32} = 4\sqrt{2}$

$AC = \sqrt{(2-2)^2+(7-3)^2} = \sqrt{(4)^2} = \sqrt{16} = 4$

Isosceles

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

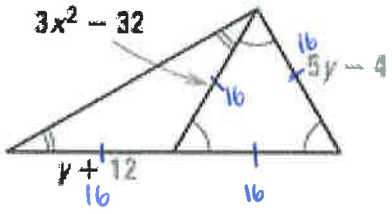
$m_{\overline{AC}} = \frac{7-3}{2-2} = \frac{4}{0}$ = und.

opp. recip.

so

right Δ

13. Given the diagram below, please solve for x and y.



$5y - 4 = y + 12$

$4y - 4 = 12$

$4y = 16$

$\boxed{y = 4}$

$3x^2 - 32 = 16$

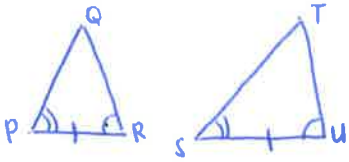
$3x^2 = 48$

$x^2 = 16$

$\boxed{x = 4}$

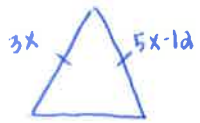
14. State the third congruency that must be given to prove $\Delta PQR \cong \Delta STU$ using the ASA Congruence Postulate.

Given: $\angle R \cong \angle U, \angle P \cong \angle S$



$\boxed{\text{By ASA, } \overline{SU} \cong \overline{PR}}$

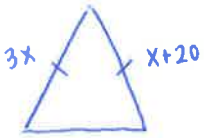
15. The lengths of the sides of a triangle are 3x, 5x – 12, and x + 20. Please find the values of x that make the triangle isosceles.



$3x = 5x - 12$

$-2x = -12$

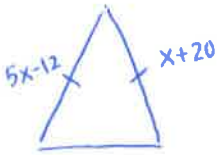
$\boxed{x = 6}$



$3x = x + 20$

$2x = 20$

$\boxed{x = 10}$

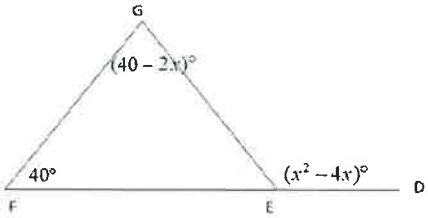


$5x - 12 = x + 20$

$4x - 12 = 20$

$4x = 32 \Rightarrow \boxed{x = 8}$

16. Given the diagram below, please find all possible angle measures for m∠GEF.



$x^2 - 4x = 40 - 2x + 40$

$x^2 - 4x = 80 - 2x$

$x^2 - 2x - 80 = 0$

$(x - 10)(x + 8) = 0$

$x = 10, x = -8$

When $x = 10$: $m\angle F = 40°$, $m\angle G = 20°$

$\boxed{m\angle GEF = 100°}$

When $x = -8$: $m\angle F = 40°$, $m\angle G = 56°$

$\boxed{m\angle GEF = 84°}$

17. Given the diagram below, please find the measures of all of the numbered angles.

$\Delta A: 90 + 40 + m\angle 1 = 180$

$\boxed{m\angle 1 = 50°}$

$\boxed{m\angle 3 = 50°}$ b/c VAT

$\Delta C: 90 + 50 + m\angle 5 = 180$

$\boxed{m\angle 5 = 40°}$

$m\angle 1 + m\angle 2 = 180$ (Linear Pair)

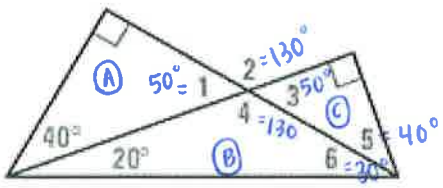
$50 + m\angle 2 = 180$

$\boxed{m\angle 2 = 130°}$

$\boxed{m\angle 4 = 130°}$ b/c VAT

$\Delta B: 20 + 130 + m\angle 6 = 180$

$\boxed{m\angle 6 = 30°}$



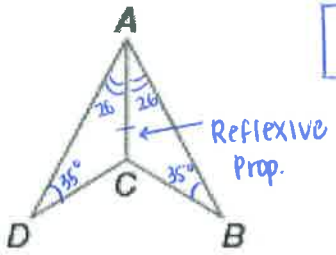
18. Can the triangles be proven congruent based on the given information? If so, state the postulate or theorem you would use to prove congruency.

$m\angle ADC = 35°$

$m\angle ABC = 35°$

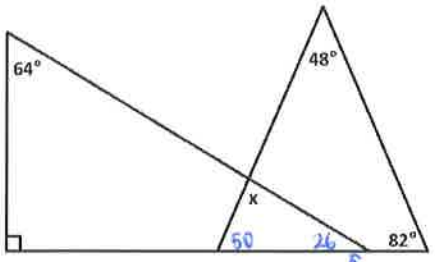
$m\angle DAC = 26°$

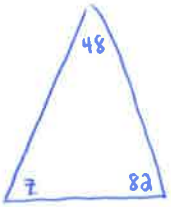
$m\angle BAC = 26°$



Yes, $\Delta ACD \cong \Delta ACB$ by AAS

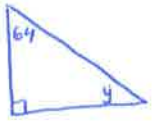
19. Given the diagram below, please solve for x.





$48+8a+7=180$

$7=50$



$y+64+90=180$

$y=26$

$x+50+26=180$

$x=104°$

20. The measures of the angles of a triangle are $(2\sqrt{2x})°$, $(2\sqrt{2x})°$, and $(5\sqrt{2x})°$. Please find the measure of each angle.

$2\sqrt{ax}+2\sqrt{ax}+5\sqrt{ax}=180$

$9\sqrt{ax}=180$

$\sqrt{ax}=20$

$ax=400$

$x=200$

$= 2\sqrt{2(200)}$

$= 2\sqrt{400}$

$= 2(20)$

$= 40°$

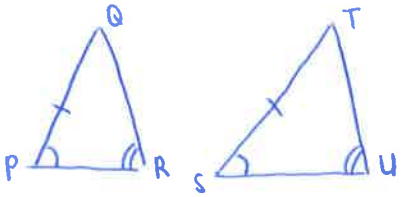
$= 5\sqrt{2(200)}$

$= 5\sqrt{400}$

$= 5(20)$

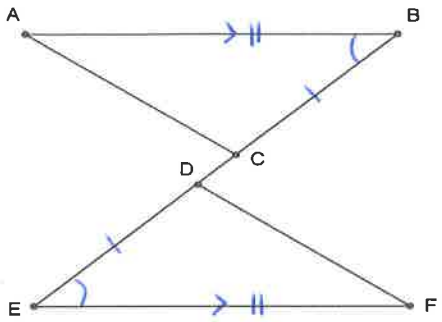
$= 100°$

21. Given that $\angle P \cong \angle S$ and $\overline{PQ} \cong \overline{ST}$, state the third congruency that must be given to prove $\Delta PQR \cong \Delta STU$ using the AAS Postulate.



By AAS, $\angle R \cong \angle U$

22.

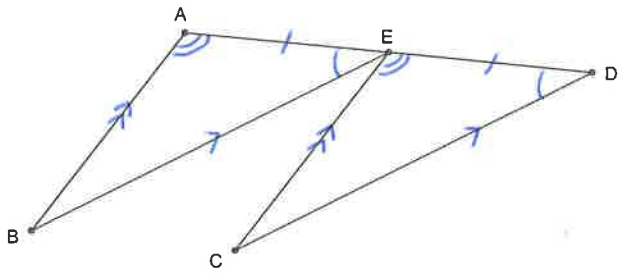


Given : $\overline{AB} \| \overline{EF}$, $\overline{AB} \cong \overline{EF}$, $\overline{BC} \cong \overline{DE}$

Prove : $\Delta ABC \cong \Delta FED$

Statements	Reasons
1. $\overline{AB} \| \overline{EF}$	1. Given
2. $\overline{AB} \cong \overline{EF}$	2. Given
3. $\overline{BC} \cong \overline{DE}$	3. Given
4. $\angle B \cong \angle E$	4. Alt. Int. Angles Thm
5. $\Delta ABC \cong \Delta FED$	5. SAS

23.

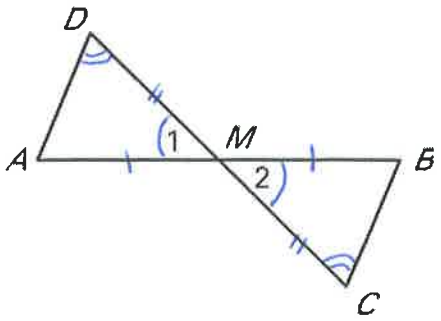


Given : E is the midpoint of $\overline{AD}$, $\overline{EB} \| \overline{DC}$, $\overline{AB} \| \overline{EC}$

Prove : $\Delta ABE \cong \Delta ECD$

Statements	Reasons
1. E is the midpoint of $\overline{AD}$	1. Given
2. $\overline{AE} \cong \overline{DE}$	2. Def of midpoint
3. $\overline{EB} \| \overline{DC}$	3. Given
4. $\angle AEB \cong \angle EDC$	4. Corresponding Angles Postulate
5. $\overline{AB} \| \overline{EC}$	5. Given
6. $\angle BAE \cong \angle CED$	6. Corresponding Angles Postulate
7. $\Delta ABE \cong \Delta ECD$	7. ASA

24.



Given: $\overline{AB}$ and $\overline{CD}$ bisect each other at point M

Prove : $\overline{AD} \| \overline{BC}$

Statements	Reasons
1. $\overline{AB}$ and $\overline{CD}$ bisect each other at point M	1. Given
2. $\overline{AM} \cong \overline{BM}$	2. Def of segment bisector
3. $\overline{DM} \cong \overline{CM}$	3. Def of segment bisector
4. $\angle 1 \cong \angle 2$	4. VAT
5. $\triangle DMA \cong \triangle CMB$	5. SAS
6. $\angle D \cong \angle C$	6. CPCTC
7. $\overline{AD} \parallel \overline{BC}$	7. Alt. Int. Angles Converse
8.	8.

Answer Key

Question 1 : x = 85, y = 65

Question 2 : $\angle S, \angle Z, \angle T$

Question 3 : $66°$

Question 4 : x = 150

Question 5 : 64 cm

Question 6 : x = 29, y = 64

Question 7 : x = 27, Acute Scalene

Question 8 : x = 21, $75°$

Question 9 : x = 45, $20°$

Question 10 : $30°, 60°, 90°$

Question 11 : x = 5.5 , y = 9

Question 12 : Right Isosceles

Question 13 : x = -4 or 4 , y = 4

Question 14 : $\overline{PR} \cong \overline{SU}$

Question 15 : x = 6, 8, 10

Question 16 : x = -8, $84°$, x = 10, $120°$

Question 17 : $50°, 130°, 50°, 130°, 40°, 30°$

Question 18 : AAS

Question 19 : x = 104

Question 20 : $40°, 40°, 100°$

Question 21 : $\angle R \cong \angle U$

Questions 22 – 24: Check solutions on my website