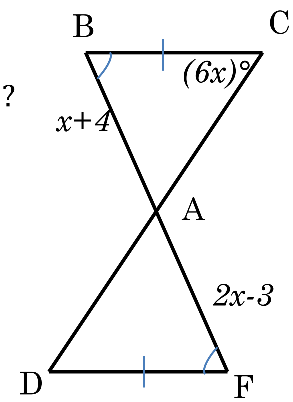
Name___________________________

1) Given $\Delta PQR \cong \Delta JKL$, $PQ = 9x - 45$, $JK = 6x + 15$, $KL = 2x$ and $JL = 5x$, what is the value of x?

2) State the theorem to prove, $\Delta ABC \cong \Delta AFD$. What is the $m\angle D$?



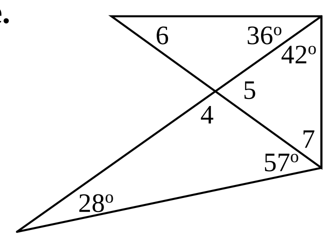
3) Determine which statement is true, given that $\Delta CBX \cong \Delta SML$.

A) $\overline{MB} \cong \overline{SL}$
B) $\overline{XC} \cong \overline{ML}$
C) $\angle X \cong \angle S$
D) $\angle XCB \cong \angle LSM$

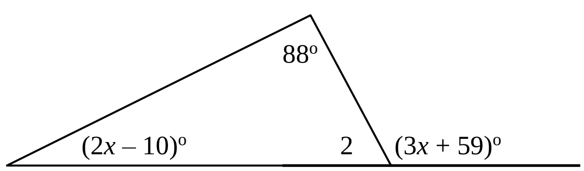
4) Classify ΔABC with vertices A(-2, -1), B(-1, 3) and C(2, 0) as scalene, isosceles, or equilateral.

For #5 – 8, find the measure of each numbered angle.

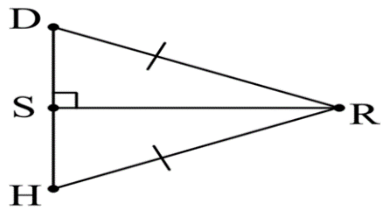
5) $m\angle 4$
6) $m\angle 5$
7) $m\angle 6$
8) $m\angle 7$



9) Solve for x and the measure of $\angle 2$.

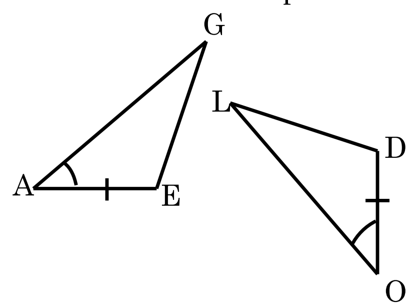


10) Are the following triangles congruent? If so, write the congruence statement and state the theorem used to prove the congruent triangles.



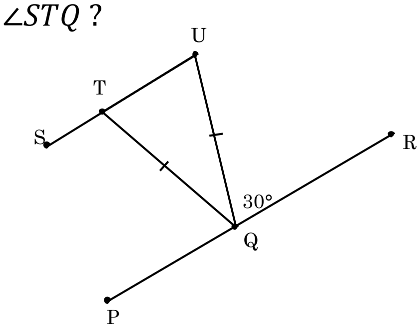
11) In the figure, $\angle GAE \cong \angle LOD$ *and* $\overline{AE} \cong \overline{DO}$. What information is needed to prove that $\Delta AGE \cong \Delta OLD$ by SAS ?

A. $\overline{GE} \cong \overline{LD}$
B. $\overline{AG} \cong \overline{OL}$
C. $\angle AGE \cong \angle OLD$
D. $\angle AEG \cong \angle ODL$

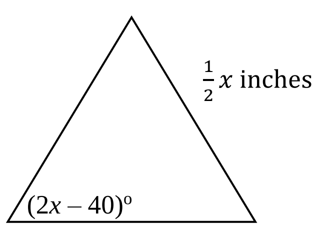


12) In the figure, $\overline{PR} \parallel \overline{SU}$ and $\overline{QT} \cong \overline{QU}$. What is the measure of $\angle STQ$?

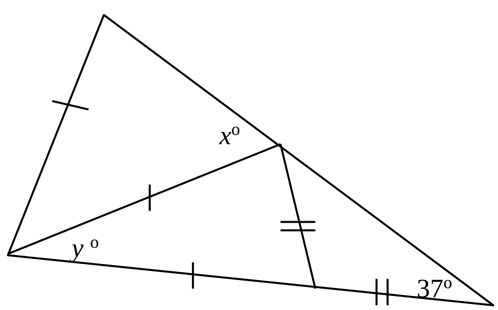
A. 30°
B. 120°
C. 150°
D. 165°



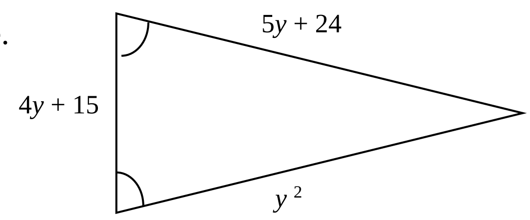
13) Find the perimeter of the equilateral triangle shown below.



14a) Find the measure of *x* and *y*.

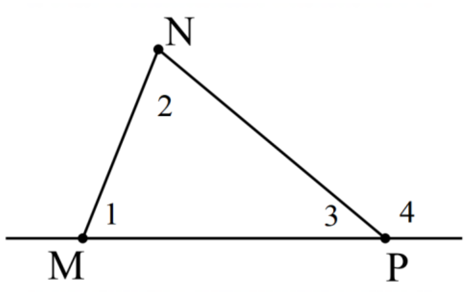


15) Find *y* and the perimeter of the triangle.



16)

Given ΔMNP, Anna is proving $m\angle 1 + m\angle 2 = m\angle 4$. Which statement should be part of her proof?



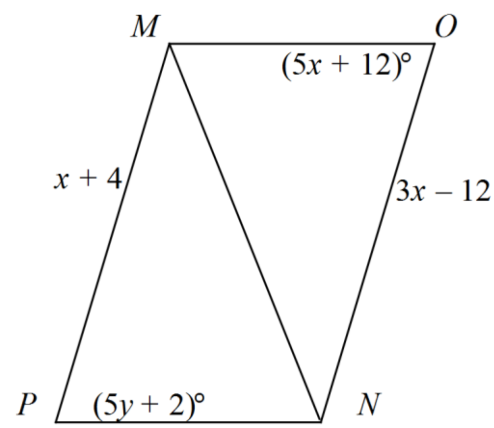
A. $m\angle 1 = m\angle 2$

B. $m\angle 1 = m\angle 3$

C. $m\angle 1 + m\angle 3 = 180°$

D. $m\angle 3 + m\angle 4 = 180°$

17) In the figure, $\Delta MON \cong \Delta NPM$. Find the values of *x* and *y*.



18) Given the coordinates below for the three vertices of a triangle, which option can be proven to be an isosceles triangle?

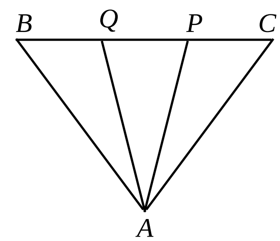
$A.\ P(a,b), Q(c,d), R\ (e,f)$

$B.\ \ P(0,0), Q(2a,0), R(a,b)$

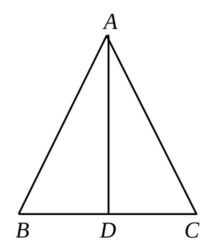
$C.\ P(0,0), Q(a,b), R(2a,3b)$

$D.\ P(a,a), Q(b,b), R(c,c)$

19) **Given:** $\angle B \cong \angle C, \overline{BP} \cong \overline{QC}$
Prove: $\Delta BAP \cong \Delta CAQ$



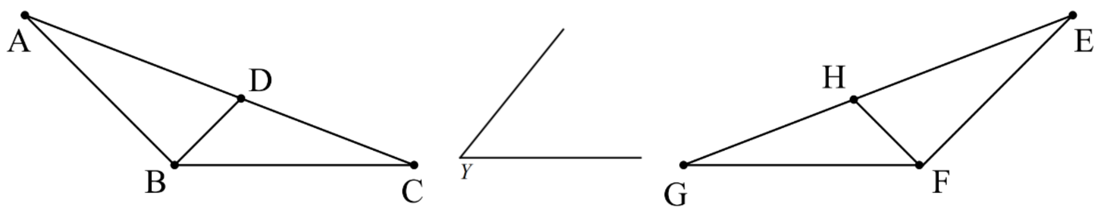
STATEMENTS	REASONS



20) **Given:** $\overline{AD} \perp \overline{BC}$; $\overline{AD}$ bisects <*BAC*
Prove: $\angle B \cong \angle C$

STATEMENTS	REASONS

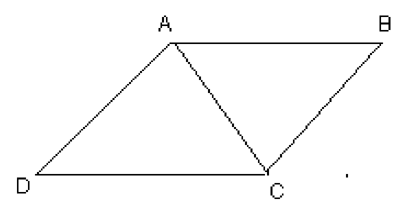
21)



Given: $\Delta BDC \cong \Delta FHG, \angle A \text{ comp to } \angle Y, \angle E \text{ comp to } \angle Y$
Prove: $\Delta ABC \cong \Delta EFG$

STATEMENTS	REASONS

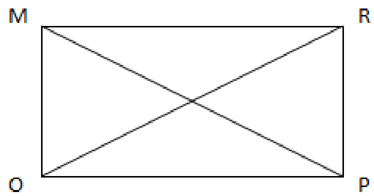
22) **Given:** $\overline{AD} \parallel \overline{CB}, \overline{AB} \parallel \overline{CD}$
Prove: $\angle B \cong \angle D$



STATEMENTS	REASONS

23) Given: $\overline{MO} \perp \overline{OP}$,
$\overline{RP} \perp \overline{OP}$,
$\overline{MP} \cong \overline{RO}$

Prove: $\triangle MOP \cong \triangle RPO$



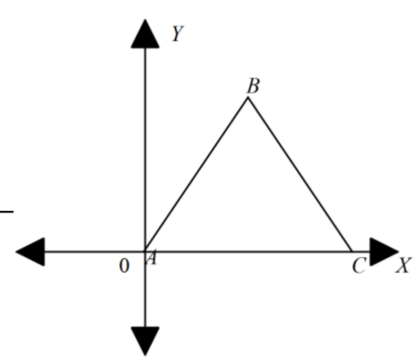
STATEMENTS	REASONS

24) ΔRST has vertices $R(4,1), S(2,5), T(-1,0)$. ΔCDF has vertices $C(1,-3), D(-1,1), F(-4,-4)$. Prove or disprove that $\Delta RST \cong \Delta CDF$.

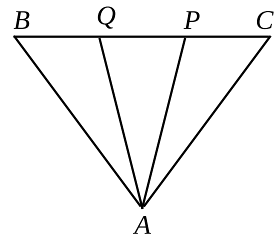
25) Prove or disprove that ΔABC with vertices A(3, 7) , B(2, -5), C(-8, -5) is isosceles.

26) Find the coordinates of C if ΔABC is isosceles with base AC.

A (0, 0), B $(6\sqrt{10}, 8)$, C (?, ?)

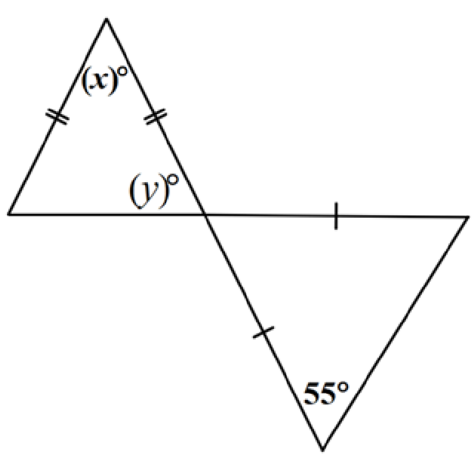


27) **Given:** $\Delta BAP \cong \Delta CAQ$
Prove: $\Delta BAQ \cong \Delta CAP$



STATEMENTS	REASONS

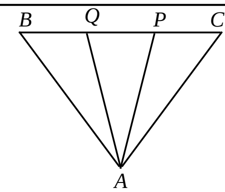
28.) Find x and y using isosceles triangle properties.

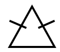


ANSWER KEY

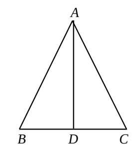
1) 20	2) AAS, 42º	3) D	4) Isosceles	5) 95	6) 85
7) 49	8) 53	9) $x = 19$, $\angle 2 = 64°$	10) Yes, $\Delta DSR \cong \Delta HSR$ by HL.		11) B
12) C	13) 75 inches	14) $x = 69$, $y = 32$	15) $y = 8$ or -3; Perimeter = 175 or 21		16) D
17) x=8, y =10	18) B				

19) **Given:** $\angle B \cong \angle C, \overline{BP} \cong \overline{QC}$
Prove: $\Delta BAP \cong \Delta CAQ$



STATEMENTS	REASONS
1) $\angle B \cong \angle C, \overline{BP} \cong \overline{QC}$	1) Given
2) $\overline{AB} \cong \overline{CA}$	2) If , then 
3) $\Delta BAP \cong \Delta CAQ$	3) SAS (1, 1, 2)

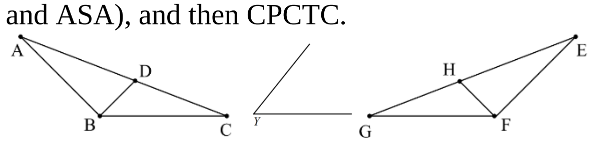
20) **Given:** $\overline{AD} \perp \overline{BC}$; $\overline{AD}$ bisects $\angle BAC$
Prove: $\angle B \cong \angle C$



STATEMENTS	REASONS
1) $\overline{AD} \perp \overline{BC}$; $\overline{AD}$ bisects <BAC	1) Given
2) ∠ADB and ∠ADC are rt ∠'s	2) If 2 seg. are perp. Then, they create rt ∠s.
3) ∠ADB ≅ ∠ADC	3) If 2 ∠s are right ∠s, then they are congruent.
4) ∠BAD ≅ ∠CAD	4) If a segment bisects an ∠, then it creates 2 congruent angles.
5) $\angle B \cong \angle C$	5) Third Angle Theorem

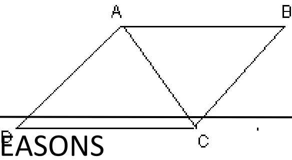
Note: can be done in 7 steps if using congruent triangles (reflexive and ASA), and then CPCTC.

21) **Given:** $\Delta BDC \cong \Delta FHG, \angle A\ comp\ to\ \angle Y, \angle A\ comp\ to\ \angle Y$
Prove: $\Delta ABC \cong \Delta EFG$



STATEMENTS	REASONS
1) $\Delta BDC \cong \Delta FHG \angle A\ comp\ to\ \angle Y, \angle A\ comp\ to\ \angle Y$	1) Given
2) $\angle A \cong \angle E$	2) If 2 angles are comp to the same angle then they are ≅ to eachother
3) $\overline{BC} \cong \overline{GF}$, <BCD ≅ <FGH	3) CPCTC
4) $\Delta ABC \cong \Delta EFG$	4) AAS (2-3-3)

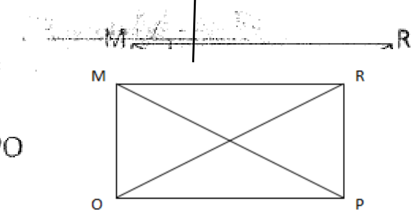
22) **Given:** $\overline{AD} \parallel \overline{CB}, \overline{AB} \parallel \overline{CD}$ **Prove:** $\angle B \cong \angle D$



STATEMENTS	REASONS
1) $\overline{AD} \parallel \overline{CB}, \overline{AB} \parallel \overline{CD}$	1) Given
2) ∠DAC ≅ ∠BCA; ∠DCA ≅ ∠BAC	2) If parallel lines, then alt int ∠s are congruent.
3) $\angle B \cong \angle D$	3) Third ∠ Theorem

23) Given: $\overline{MO} \perp \overline{OP}$, $\overline{RP} \perp \overline{OP}$, $\overline{MP} \cong \overline{RO}$

Prove: △MOP ≅ △RPO



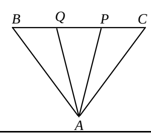
STATEMENTS	REASONS
1) $\overline{MO} \perp \overline{OP}, \overline{RP} \perp \overline{OP}, \overline{MP} \cong \overline{RO}$	1) Given
2) $\angle MOP$ and $\angle RPO$ are rt $\angle's$	2) If 2 seg. are ⊥, then they create 4 rt ∠.
3) $\overline{OP} \cong \overline{OP}$	3) Reflexive
4) $\Delta MOP \cong \Delta RPO$	4) HL (2, 1, 3)

24) Since all pairs of corresponding sides have the same length they are ≅. This makes $\Delta RST \cong \Delta CDF$ by SSS.

25) Since all sides have different lengths, no sides are ≅ which makes ΔABC scalene and not isosceles.

26) $C(12\sqrt{10}, 0)$

27) **Given:** $\Delta BAP \cong \Delta CAQ$ **Prove:** $\Delta BAQ \cong \Delta CAP$



1. $\Delta BAP \cong \Delta CAQ$	1. Given
2. $\angle ABP \cong \angle ACQ, \overline{AB} \cong \overline{AC}$ $\angle BPA \cong \angle CQA$	2. CPTCTC
3. $\angle CPA$ *supp* $\angle BPA$ $\angle BQA$ *supp* $\angle CQA$	3. If 2 angles form a linear pair, then they are supplementary angles
4. $\angle CPA \cong \angle BQA$	4. If 2 angles are supp to $\cong \angle's$, then they are ≅ to eachother.
5. $\Delta BAQ \cong \Delta CAP$	5. AAS (2-4-2)

28) x=40, y=70