Geometry H Name : _____
Unit 3 Review Date : _____ Period : ____

For each statement below, determine if it is always true, sometimes true or never true.

1. The legs of an isosceles triangle are perpendicular to the base

2. The acute angles of a right triangle are congruent.

3. An equiangular triangle is also equilateral.

4. If one of the exterior angles of an isosceles triangle is 120∘, then the triangle is equilateral.

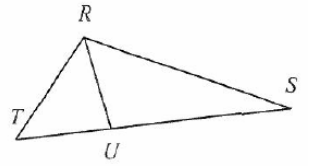
5. **TRUE OR FALSE:**
If in ΔABC, $m\angle A$ is 30° more than $m\angle B$, and $m\angle B$ is 24 less than $m\angle C$, then ΔABC is acute.

6. **MULTIPLE CHOICE:**
Which of the following triangles does not exist?

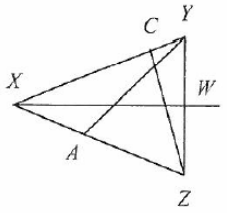
I. acute isosceles II. right scalene
III. obtuse equilateral IV. obtuse scalene

a. I only b. II only c. III only d. II and III e. II, III, IV

7. $\overline{RU}$ bisects $\angle TRS$. If $m\angle RTU = (13x-24)°$, $m\angle TRS = (12x-34)°$, and $m\angle RUS = 92°$, find $m\angle RSU$.

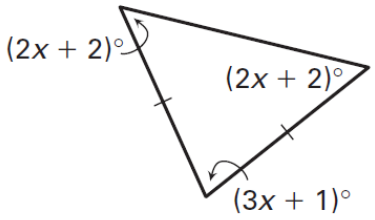


8. $\overline{XW}$ bisects $\angle ZXY$. If $m\angle WZX = (5x+11)°$, $m\angle ZXY = (6x-10)°$, and $\overline{XW} \perp \overline{ZY}$, find $m\angle WXY$.



Find the value of *x*. Then classify the triangle by its angles.

9.



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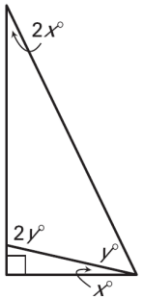

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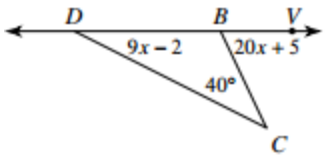

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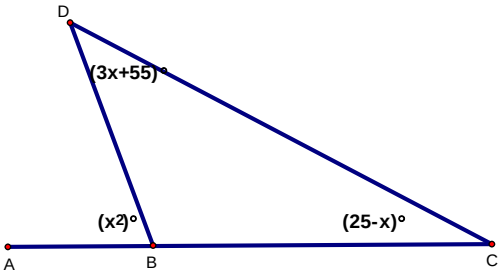
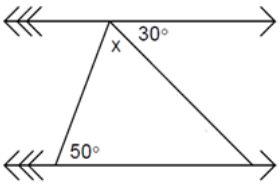
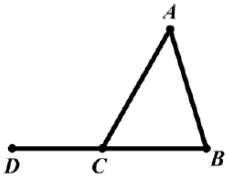


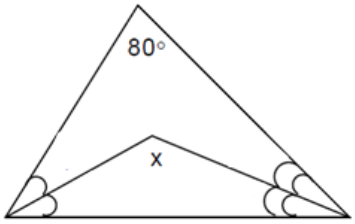
13. Note: Triangle not drawn to scale!



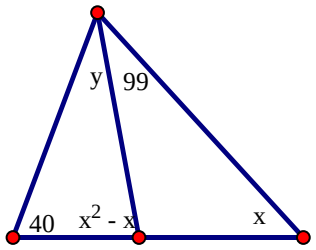
14. If $m\angle DCA = [(x-2)^2]°$, $m\angle A = (5x)°$, and $m\angle B = (3x+4)°$, please find the value of x and classify ΔABC by its sides and its angles.



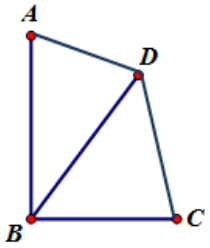
15. Solve for x.



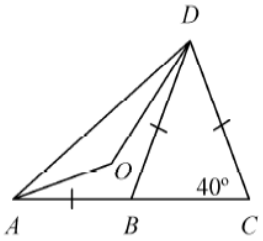
16. Find the values of x and y.



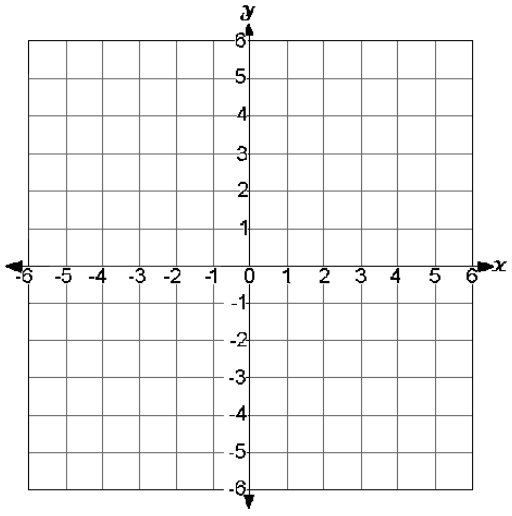
17. Given : $\overline{AB} \perp \overline{BC}$, $\overline{BD}$ bisects $\angle ABC$, $m\angle ABD = (x+5y)°$, $m\angle DBC = (2x+2y+3)°$. Find the values of x and y.



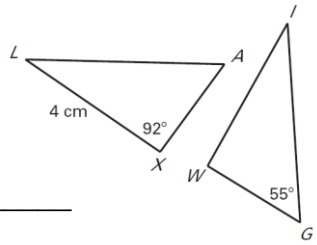
18. $\overline{AO}$ and $\overline{DO}$ are the angle bisectors of $\angle DAB$ and $\angle BDA$, respectively. $\overline{CD} \cong \overline{BD} \cong \overline{AB}$, and $m\angle C = 40°$. Find $m\angle BAO$.



19. A triangle has vertices $A(1, 1)$, $B(3, 0)$ and $C(2, 3)$. Graph the triangle and classify it by its sides and determine if it is a right triangle. Show all work. Justify your answer.



20. In the diagram, $\Delta ALX \cong \Delta GIW$. Complete the following.



a. $\overline{LX} \cong$ _____

b. $\angle I \cong$ _____

c. $\angle A \cong$ _____

d. $\overline{WG} \cong$ _____

e. $m\angle A =$ _____

f. $m\angle W =$ _____

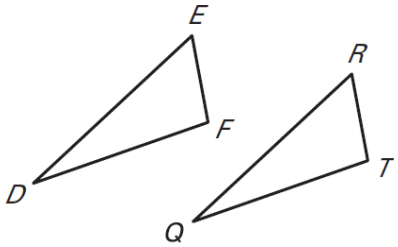
g. $m\angle I =$ _____

h. $m\angle L =$ _____

i. $IW =$ _____

j. $\Delta LAX \cong$ _____

State the congruence that is needed to prove $\Delta DEF \cong \Delta QRT$ using the given postulate or theorem.



21. Given: $\angle D \cong \angle Q$, $\angle F \cong \angle T$ using AAS

22. Given: $\angle E \cong \angle R$, $\overline{EF} \cong \overline{RT}$ using ASA

23. Given: $\overline{DE} \cong \overline{QR}$, $\angle D \cong \angle Q$ using SAS

24. In ΔABC and ΔDEF, $\overline{AB} \perp \overline{BC}$, $\overline{DE} \perp \overline{EF}$, $\overline{CB} \cong \overline{EF}$, and $\overline{AC} \cong \overline{DF}$. $\Delta ABC \cong \Delta DEF$ by which triangle congruency postulate? (HINT: It may be helpful to draw a picture!)

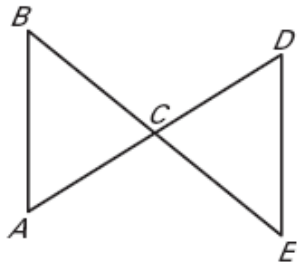
25. If $\Delta BIG \cong \Delta DAY$, all of the following are true EXCEPT:

A. $\Delta DYA \cong \Delta BGI$ B. $\Delta GIB \cong \Delta YAD$ C. $\overline{YD} \cong \overline{GB}$ D. $\angle IGB \cong \angle YAD$ E. $\overline{GI} \cong \overline{YA}$

Complete the following proofs.

26. Given: $\overline{AB} \parallel \overline{DE}$, $\overline{AB} \cong \overline{DE}$

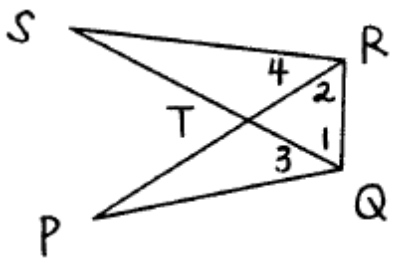
Prove: C is midpoint of $\overline{BE}$



Statements	Reasons
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.

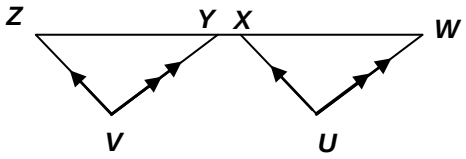
27. Given: $\angle 1 \cong \angle 2,\ \angle 3 \cong \angle 4$

Prove: $\overline{ST} \cong \overline{PT}$



Statements	Reasons
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.

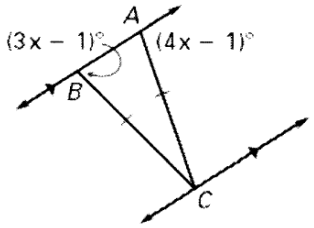
28. Given : $\overline{WU} \| \overline{YV}$, $\overline{XU} \| \overline{ZV}$, $\overline{WX} \cong \overline{YZ}$
Prove : $\Delta WXU \cong \Delta YZV$



Statements	Reasons
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.

Find the value of *x* and classify the triangle by its sides.

29.



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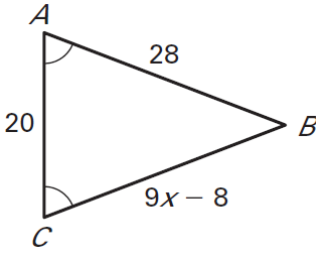

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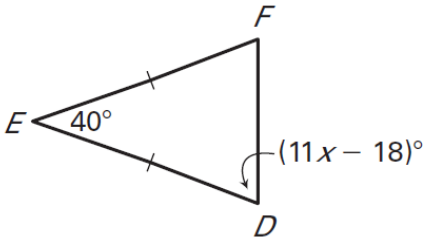

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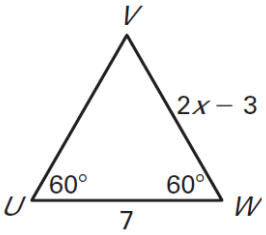

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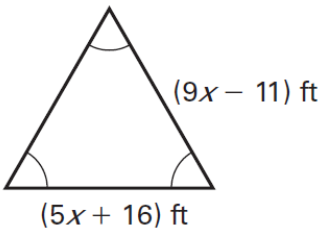

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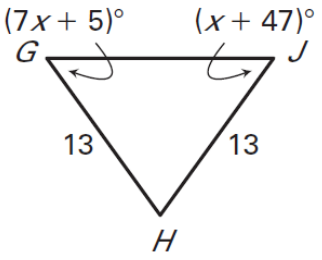
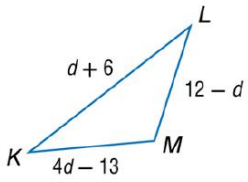


35. In triangle DEF, $m\angle D = (4x + 2)°$, $m\angle E = (6x – 30)°$, and $m\angle F = 3x°$. Classify the triangle by angles and sides. Explain your reasoning.

36. Find the measures of the sides of isosceles ΔKLM with base $\overline{KL}$.



37. ΔXYZ is equilateral. $\overline{XY}$ is two less than two times a number, $\overline{YZ}$ is six more than the number, and $\overline{XZ}$ is ten less than three times the number. Find the measure of all sides of ΔXYZ.

38. The lengths of the sides of a triangle are $3t$, $5t – 12$, and $t + 20$. Find the values of t that make the triangle isosceles (there are three different answers). Find the perimeter of the triangle using the smallest value of t.

39. In ΔXYZ, $\angle X \cong \angle Z$. If $XY = 3x + 12$ and $YZ = 8x + 2$, find the value of x.

40. $\Delta PQR \cong \Delta STV$
PQ=x^2, SV = 6, ST = x + 6, TV= 3 – x
Find all possible values for x. Then find the perimeter of ΔPQR.

Answer Key

1) Never
2) Sometimes
3) Always
4) Always
5) True
6) C
7) 63
8) 26.5
9) x=25, Isosceles Acute
10) x=12.8, y=51.4, Large triangle: Obtuse, Small triangle: Right
11) x=3, Obtuse
12) x= -8; Obtuse, x=10; Acute
13) x=100, Obtuse
14) x=12, Acute Scalene
15) 130
16) x=11, y=30
17) x=15, y=6
18) 10
19) Right Isosceles Triangle
20) A. $\overline{IW}$ B. $\angle$ L C. $\angle$G D. $\overline{XA}$ E. 55° F. 92° G. 33° H. 33° I. 4cm J. Δ IGW
21) $\overline{ED} \cong \overline{QR}$ or $\overline{EF} \cong \overline{RT}$
22) $\angle F \cong \angle T$
23) $\overline{DF} \cong \overline{QT}$
24) HL
25) D
26)

Statements	Reasons
1. $\overline{AB} \parallel \overline{DE}$, $\overline{AB} \cong \overline{DE}$	1. Given
2. $\angle B \cong \angle E$ (or $\angle A \cong \angle D$)	2. Alternate Interior Angles Theorem
3. $\angle BCA \cong \angle ECD$	3. Vertical Angles
4. $\Delta BCA \cong \Delta ECD$	4. AAS (or ASA)
5. 6. $\overline{BC} \cong \overline{CE}$	5. CPCTC
7. C is midpoint of $\overline{BE}$	6. Definition of Midpoint

27)

Statements	Reasons
1. $\angle 1 \cong \angle 2$	1. Given
2. $\angle 3 \cong \angle 4$	2. Given
3. $\angle PTQ \cong \angle STR$	3. Vertical Angles Theorem
4. $\overline{TQ} \cong \overline{TR}$	4. Base Angles Converse
5. $\Delta PTQ \cong \Delta STR$	5. ASA
6. $\overline{ST} \cong \overline{PT}$	6. CPCTC

28)

Statements	Reasons
1. $\overline{WU} \parallel \overline{YV}$	1. Given
2. $\overline{XU} \parallel \overline{ZV}$	2. Given
3. $\overline{WX} \cong \overline{YZ}$	3. Given
4. $\angle VZY \cong \angle UXW$	4. Corresponding Angles Postulate
5. $\angle VYZ \cong \angle UWX$	5. Corresponding Angles Postulate
6. $\Delta WXU \cong \Delta YZV$	6. ASA

29) x=26, Isosceles
30) x=4, Isosceles
31) x=8, Isosceles
32) x=5, Equilateral
33) x=6.75, Equilateral
34) x=7, Isosceles
35) x=16, Acute Isosceles
36) d=5, ML=7, MK=7, KL=11
37) x=8, XY=14, YZ=14, XZ=14
38) t=6, t=10, t=8, P=62 units
39) x=2
40) x=-2, P=15 units