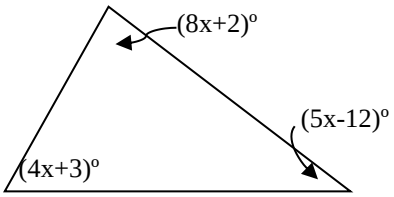
Name_____ Date_____ Period_____
Unit 4 Review

1. First, list the ways to classify ANY triangle according to its **angles**:

   1) _____
   2) _____
   3) _____
   4) _____

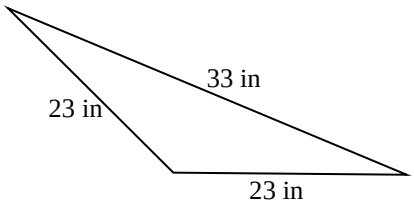
   Now classify the triangle at right according to its angles: _____ (provide work below)



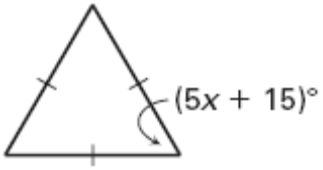

2. First, list the ways to classify ANY triangle according to its **sides**:

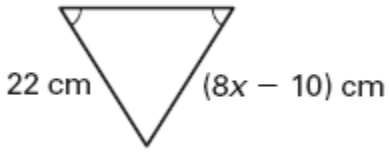
   1) _____
   2) _____
   3) _____

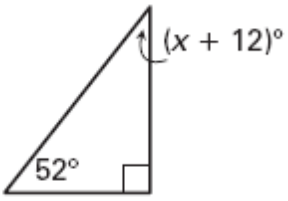
   Now classify the triangle at right according to its sides: _____



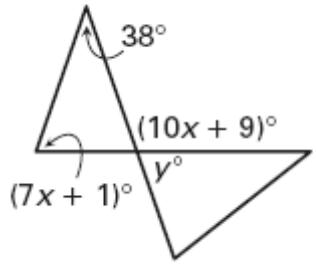

**Find the value of *x*.**

3. 

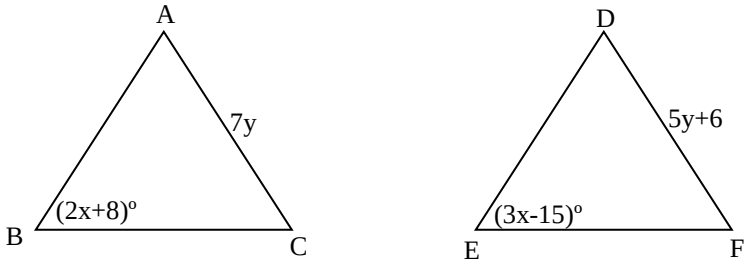

4. 


5. 

6. Find the value of x and y.




7. Given $\Delta ABC \cong \Delta DEF$, find $m\measuredangle B$ and $DF$.




**8.** Match the theorem with the correct pair of congruent triangles.

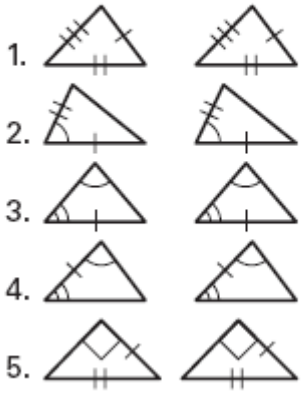
**a.** ASA

**b.** SAS

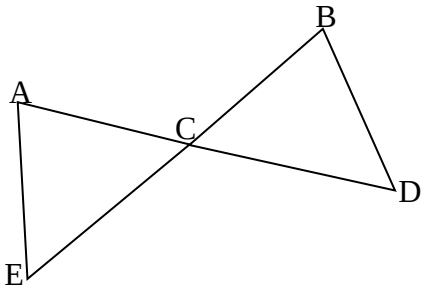
**c.** HL

**d.** SSS

**e.** AAS




9. Given $\overline{AC} \cong \overline{BC}$, $\measuredangle E \cong \measuredangle D$,



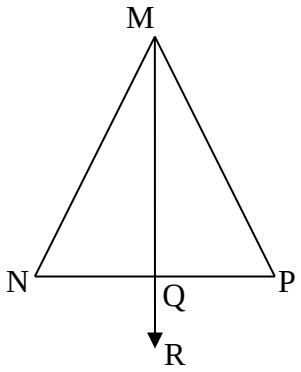

A) Complete the congruency statement:

$\Delta AEC \cong$ _____ by _____.

B) Describe the precise sequence of rigid motions that maps $\Delta AEC$ onto the other triangle.

C) Why would $\overline{AE} \cong \overline{BD}$? _____

**Complete each of the following proofs by any appropriate method.**



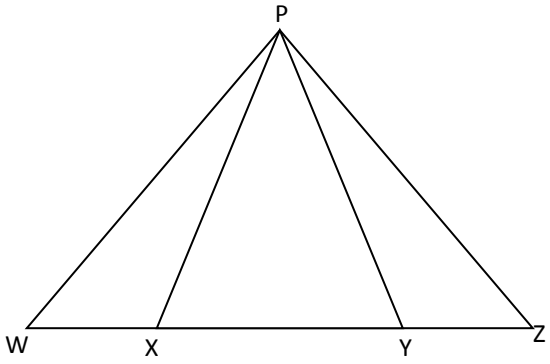

10. A) Given: $\Delta MNP$ is isosceles with base $\overline{NP}$
$\overrightarrow{MR}$ bisects $\overline{NP}$ at $Q$

Prove: $\angle NQM \cong \angle PQM$ using congruent triangles

B) Describe the rigid motion that would map $\Delta NQM$ onto $\Delta PQM$ .

11. Given: $\Delta WPZ$ is an isosceles $\Delta$ w/base $\overline{WZ}$
$\overline{WX} \cong \overline{ZY}$

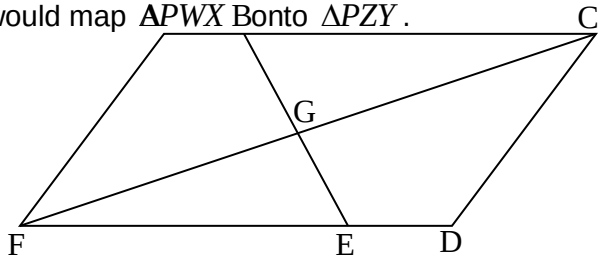
Prove: $\measuredangle WPY \cong \measuredangle ZPX$



B) Describe the sequence of rigid motion(s) that would map $\Delta PWX$ onto $\Delta PZY$.

12. A) Given: $\overline{AC} \parallel \overline{FD}$ and $\overline{FC}$ bisects $\overline{BE}$ at $G$

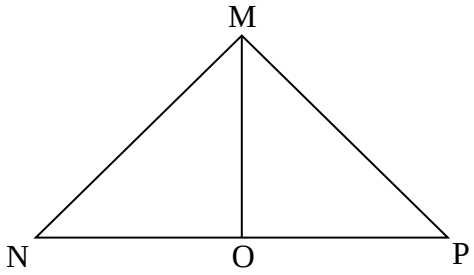
Prove: $\overline{BC} \cong \overline{EF}$




B) Describe the rigid motion that would map $\Delta BGC$ onto $\Delta EGF$.

13. A) Given: $\overline{MO} \perp \overline{NP}$, $\overline{MN} \cong \overline{MP}$

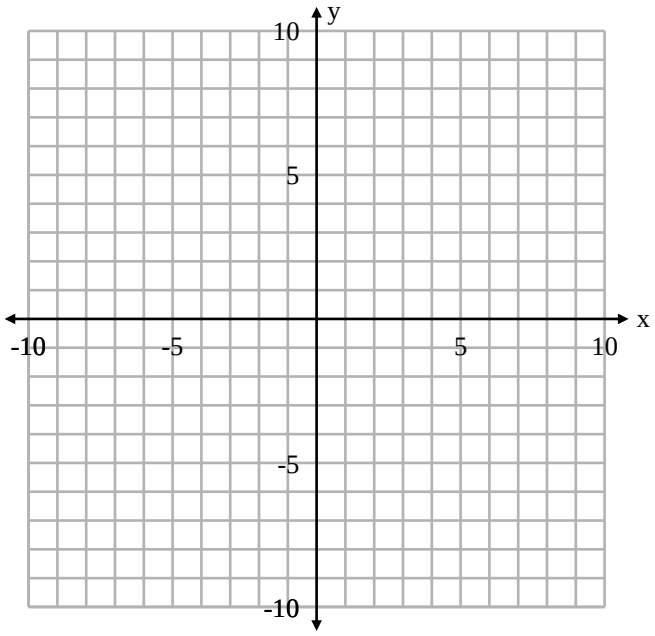
Prove: $\overline{NO} \cong \overline{PO}$




B) Describe the rigid motion that would map $\Delta MON$ onto $\Delta MOP$

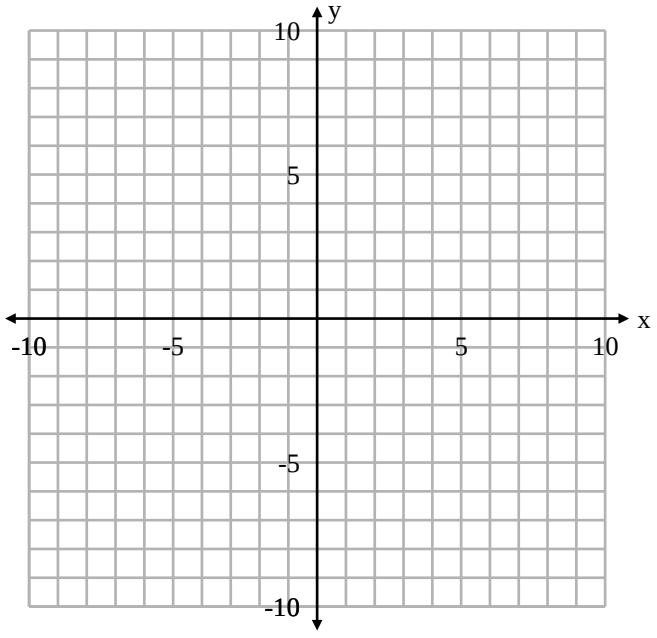
14. Given: $\Delta ABC$ with vertices $A(-2,1), B(6,5), C(-1,9)$. D is the midpoint of $\overline{AB}$

Prove: $\Delta BDC$ is a right triangle




15. Given: $\Delta PQR$ with vertices $P(-4,-3), Q(-2,3), R(4,1)$

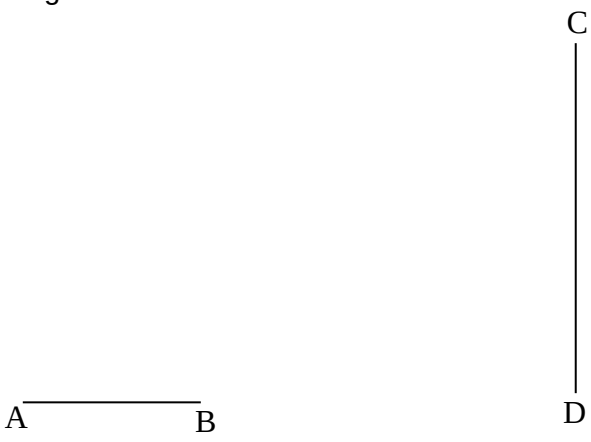
Prove: $\Delta PQR$ is an isosceles triangle



16. Construct using only a compass and a straight edge:

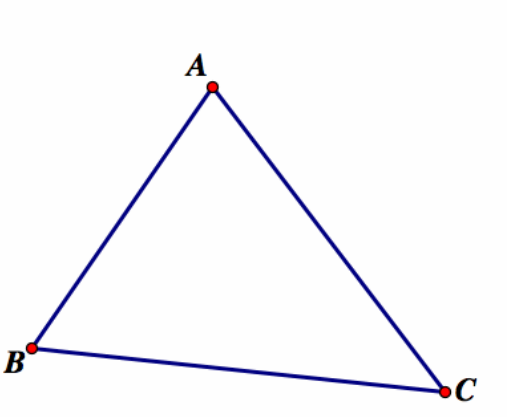
A) an isosceles triangle **on base** $\overline{AB}$ whose legs are congruent to $\overline{CD}$

B) an equilateral triangle **on** $\overline{CD}$

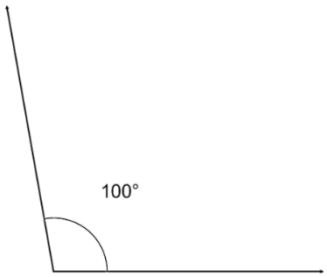



17. Construct right scalene triangle using only a compass and a straight edge.

18. Formally construct $\Delta DEF \cong \Delta ABC$. State the criteria you used: _____



19. Formally construct isosceles ΔJKL on the given base $\overline{JK}$ whose base angles each measure 50°.




J _____ K

**GEOMETRY Unit 4 Review 2016-17 ANSWERS**

| | | | |
|---|---|---|---|
| 1. Right, Obtuse, Acute, Equiangular<br>$x = 11$, a right Δ | 2. Isosceles, Scalene, Equilateral<br>Isosceles Δ | 3. $x = 9$ | 4. $x = 4$ |
| 5. $x = 26$ | 6. $x = 10 \quad y = 71$ | 7. $m\measuredangle B = 54$ and $DF = 21$ | |

| | |
|---|---|
| 8. a-4<br>b-2<br>c-5<br>d-1<br>e-3 | 9. A. $\Delta AEC \cong \Delta BDC$; $AAS \cong AAS$<br>B. Rotate $\Delta AEC$ around C, m∡ECD to map C → C, E → D, A → A'.<br>Then reflect over $\overleftrightarrow{CD}$ to map C&D to themselves and A' to B.<br>*Or* Rotate $\Delta AEC$ around C, m∡ACB to map C → C, E → E', A → B.<br>Then reflect over $\overleftrightarrow{CB}$ to map C&B to themselves and E' to D.<br>C. Corresponding parts of congruent triangles are congruent (CPCTC) |

10. Reflect $\Delta NQM$ into $\overleftrightarrow{MR}$ to map M and Q to themselves and N to P

| | |
|---|---|
| 1. $\Delta MNP$ is isosceles w/base $\overline{NP}$ | 1. Given |
| 2. $\overline{MN} \cong \overline{MP}$ | 2. The legs of an isosceles Δ are ≅ |
| 3. $\overleftrightarrow{MR}$ bisects $\overline{NP}$ at $Q$ | 3. Given |
| 4. $Q$ *is the midpoint of* $\overline{NP}$ | 4. segment bisector → midpoint |
| 5. $\overline{NQ} \cong \overline{PQ}$ | 5. midpoint → 2 ≅ segments |
| 6. $\overline{MQ} \cong \overline{MQ}$ | 6. reflexive property |
| 7. $\Delta NQM \cong \Delta PQM$ | 7. SSS≅ SSS (Steps 2, 5, 6) → ≅ Δs |
| 8. $\measuredangle NQM \cong \measuredangle PQM$ | 8. CPCTC |

11. Rotate around P by $m\measuredangle XPY$ to map P to itself, X to Y, and W to W'. Then reflection into $\overleftrightarrow{PX}$ to map P and Y to themselves and W' to Z. In function notation: $r_{\overleftrightarrow{PX}}(R_{P,\, m\measuredangle XPY}(\Delta PWX)) \rightarrow \Delta PZY$

| | |
|---|---|
| 1. $\Delta WPZ$ is isosceles w/base $\overline{WZ}$ | 1. Given |
| 2. $\overline{WP} \cong \overline{ZP}$ | 2. The legs of an isos Δ are ≅ (defn of isos triangle) |
| 3. $\measuredangle W \cong \measuredangle Z$ | 3. Isosceles Δ → base angles congruent (Isos Δ Thm) |
| 4. $\overline{WX} \cong \overline{ZY}$ | 4. Given |
| 5. $\overline{XY} \cong \overline{XY}$ | 5. Reflexive |
| 6. $\overline{WY} \cong \overline{ZX}$ | 6. Overlapping Segments Theorem |
| 7. $\Delta WPY \cong \Delta ZPX$ | 7. SAS≅ SAS (Steps 2, 3, 6) → ≅ Δs |
| 8. $\measuredangle WPY \cong \measuredangle ZPX$ | 8. CPCTC |

12. Rotate $\Delta CBG$ around G 180° to map G to itself, C to F, B to E.
Or reflect $\Delta CBG$ into point G to map G to itself, C to F, B to E.

| | |
|---|---|
| 1. $\overline{AC} \parallel \overline{FD}$ | 1. Given |
| 2. $\measuredangle BCF \cong \measuredangle CFD$; $\measuredangle CBG \cong \measuredangle FEG$ | 2. Parallel lines → alternate interior angles ≅ |
| 3. $\overline{FC}$ bisects $\overline{BE}$ at G | 3. Given |
| 4. $\overline{BG} \cong \overline{EG}$ | 4. Definition of a segment bisector |
| 5. $\Delta CBG \cong \Delta FEG$ | 5. AAS≅ AAS (Steps 2,2,4) → ≅ Δs |
| 6. $\overline{BC} \cong \overline{EF}$ | 6. CPCTC |
| Note: could use vertical angles are congruent for either AAS≅ or ASA≅ criteria | |

13. Reflect $\Delta MON$ into $\overleftrightarrow{MO}$ to map M and O to themselves and N to P

| | |
|---|---|
| 1. $\overline{MO} \perp \overline{NP}$ | 1. given |
| 2. $\measuredangle NOM$ is a right $\measuredangle$, $\measuredangle POM$ is a right $\measuredangle$ | 2. ⊥ lines → right ∡s (or defn of ⊥ lines) |
| 3. $\Delta NOM$ is a right Δ, $\Delta POM$ is a right Δ | 3. a Δ $w/1$ right $\measuredangle$ is a right Δ (or defn of rt Δ ) |
| 4. $\overline{MN} \cong \overline{MP}$ | 4. Given |
| 5. $\overline{MO} \cong \overline{MO}$ | 5. reflexive property |
| 6. $\Delta MNO \cong \Delta MPO$ | 6. $R_{\Delta}HL \cong R_{\Delta}HL$ (steps 3, 4, 5) → ≅ Δs |
| 7. $\overline{NO} \cong \overline{PO}$ | 7. CPCTC |

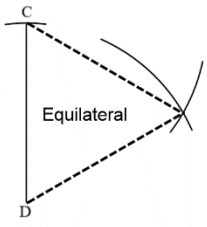
14.

| Algebraic Work: | Concluding Statements |
|---|---|
| $D(3,0)$<br>$m_{\overline{BD}} = undefined$<br>$m_{\overline{CD}} = 0$ | Since the slope of $\overline{BD}$ is undefined, it is a vertical line. And, since the slope of $\overline{CD}$ is 0 it is a horizontal line. Therefore $\overline{BD} \perp \overline{CD}$. Since ⊥ lines form right ∡s, then $\measuredangle BDC$ is a right $\measuredangle$ and $\Delta BDC$ is a right Δ by definition. |

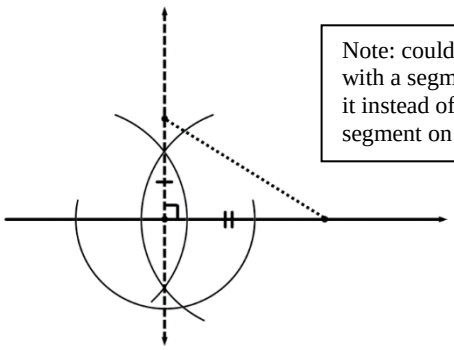
15.

| Algebraic Work: | Concluding Statements |
|---|---|
| $AB = 2\sqrt{13}$<br>$BC = 2\sqrt{13}$<br>$AC = 8$ | Since $AB = 2\sqrt{13} = BC$, then $\overline{AB} \cong \overline{BC}$. Therefore, since at least two sides of $\Delta ABC$ are ≅, then it is an isosceles Δ by definition. |

16.

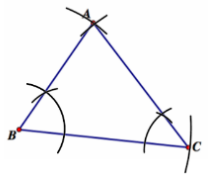



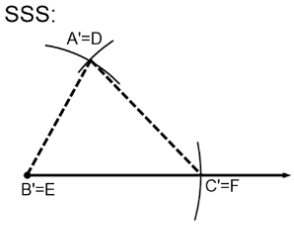

17.

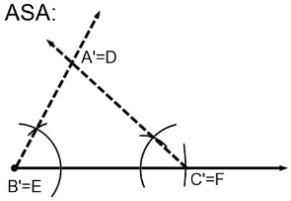


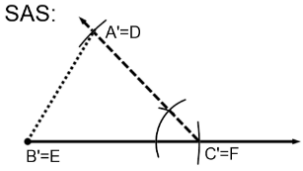
Note: could also just start with a segment and bisect it instead of creating a segment on a ray

18.




19.