Chapter 2 Review

Geometry

1. Make a conjecture about the next item in the sequence. *add consecutive even integers to previous element*

   3, 5, 9, 15, 23
   +2 +4 +6 +8

   $23 + 10 = \boxed{33}$

2. Make a conjecture about the next item in the sequence,

   $\frac{7}{8}, \frac{9}{10}, \frac{11}{12}, \frac{13}{14}, \frac{15}{16}$ $\rightarrow \boxed{\frac{17}{18}}$ *add 2 to numerator and 2 to denominator*

   ×2 ×2 ×2 ×2 ×2

3. Determine whether the conjecture is *true* or *false*. Given: ∠1 and ∠2 are complementary angles. Conjecture: m∠1 = m∠2 = 45.

   False ; counterexample: m∠1 = 30 ≇ m∠2 = 60.

4. Determine whether the conjecture is *true* or *false*. Given: ΔLMN has two congruent sides. Conjecture: $\overline{LM} \cong \overline{MN}$
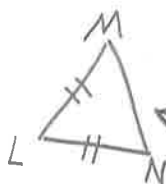
   False counterexample: $\overline{LM} \cong \overline{LN}$

5. Find the next two terms in the sequence: 1024, −256, 64, −16, …. $\boxed{4, -1}$

   divide previous by −4

6. Identify the hypothesis and conclusion.
   If 4x − 3 = 29, then x = 8. *follows "if"*
   Hyp: 4x−3=29
   Con: x=8

7. Write the statement in if-then form?
   Smoking makes you less fit.
   If you smoke, then you will be less fit.

8. Write the statement in if-then form?
   Octagons have 8 sides.
   If a figure is an Octagon, then it has 8 sides.

9. Given the statement, "If you live in Chicago, then you live in Illinois," which of the following is true?

   same A. the negation of the statement *If you don't live in Chicago, then you don't live in IL. False*
   B. the inverse of the statement
   C. the converse of the statement *If you live in IL, then you live in Chic. False*
   D. the contrapositive of the statement
   If you don't live in IL, then you don't live in Chic. TRUE

10. Write the inverse of the statement: If a trapezoid has congruent legs, then it is Isosceles.

    If a trapezoid does not have ≅ legs, then it is not Isosceles.

Use the following diagram for 11-15:

follows "then"
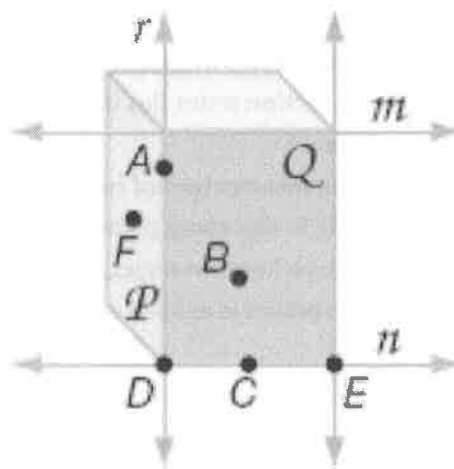
11. Which option states the postulate that can be used to show that *A* and *F* are collinear?

Post. 2.1 →

   A. Through any two points, there is exactly one line.
   B. A line contains only two points.
   C. If two points lie in a plane, then the entire line containing those points lies in that plane.
   D. Through any two points, there are many lines.

12. Which option states the postulate that can be used to show that D, C, and E are collinear?

Post. 2.3 →

   A. A line contains at least two points.
   B. A line contains only two points.
   C. A line contains at least three points.
   D. A line contains only three points.

13. Which option states the postulate that can be used to show that $\overleftrightarrow{AD}$ intersects $\overleftrightarrow{EC}$ at point *D*?
   A. The intersection point of two lines lies on a third line, not in the same plane.
   B. If two lines intersect, then their intersection point lies in the same plane.
   C. The intersection of two lines does not lie in the same plane.
   D. If two lines intersect, then their intersection is exactly one point.

Post. 2.6 →

14. Which option states the postulate that can be used to show that *A*, *B*, and *C* are coplanar?

   A. Through any two points on the same line, there is exactly one plane.
   B. Through any three points not on the same line, there is exactly one plane.

Post. 2.2

   C. If two points lie in a plane, then the entire line containing those points lies in that plane.
   D. If two lines intersect, then their intersection lies in exactly one plane.

15. Which option states the postulate that can be used to show that $\overleftrightarrow{AB}$ lies in plane *Q*?
   A. Through two points, there is exactly one line in a plane.
   B. Any plane contains an infinite number of lines.
   C. Through any two points on the same line, there is exactly one plane.
   D. If two points lie in a plane, then the entire line containing those points lies in that plane.

Post. 2.5

16. Justify the statement with a property of equality or a property of congruence.
   If $\overline{AB} \cong \overline{CD}$, then $\overline{CD} \cong \overline{AB}$.
   Symmetric prop.
   (If a=b, then b=a)

17. Justify the statement with a property of equality or a property of congruence.
   If $\angle LMN \cong \angle XYZ$, and $\angle XYZ \cong \angle TUV$, then $\angle LMN \cong \angle TUV$.
   Transitive prop.
   (If a=b & b=c, then a=c)

18. **State a conclusion that can be drawn from the statements given using the property indicated.**

    T is the midpoint of MV.

    Def. of midpoint/Midpoint Theorem.

    $MT = TV$

    or

    $\overline{MT} \cong \overline{TV}$

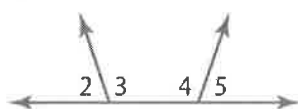19. Given U is between S and V, write a true statement.

    $SU + UV = SV$
    by the seg. add. post.

20. **Justify the statement with a property of equality or a property of congruence.**

    $\overline{JK} \cong \overline{JK}$
    Reflexive prop.
    $(a = a)$

21. Find the measure of ∠3 using the congruent supplements theorem, given ∠2 and ∠4 and ∠4 and ∠5 are supplementary, and m∠4 = 105.

    $m\angle 4 + m\angle 5 = 180$ (suppl. thm.)
    $105 + m\angle 5 = 180$
    $m\angle 5 = 75$
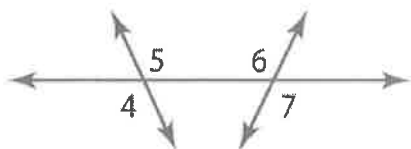   since ∠5 and ∠2 are both suppl. w/∠4
    then $\angle 2 \cong \angle 5$ ($\cong$ suppl. thm.)
    $m\angle 2 + m\angle 3 = 180$ (suppl. thm.)
    $75 + m\angle 3 = 180$
    $\boxed{m\angle 3 = 105°}$

22. Name the definition, postulate, or theorem used to justify the following:

    $\angle 4 \cong \angle 5$. Vertical ∠s Theorem

23. Theorem 2.10 states that all right angles are __Congruent__ ($\cong$).

24. Name the definition, postulate, or theorem used to justify the following:
    Given ∠LMN ≅ ∠XYZ,
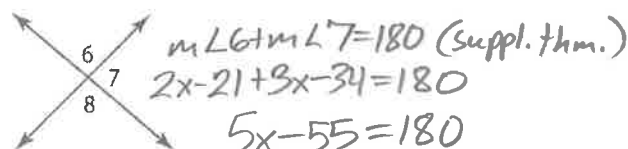   Then m∠LMN = m∠XYZ.

    by Definition of $\cong$ angles

25. Find the measure of ∠8.

    $m\angle 6 = 2x - 21$
    $m\angle 7 = 3x - 34$

    $m\angle 6 + m\angle 7 = 180$ (suppl. thm.)
    $2x - 21 + 3x - 34 = 180$
    $5x - 55 = 180$
    $\dfrac{5x}{5} = \dfrac{235}{5}$
    $x = 47$
    $m\angle 6 = 2(47) - 21 = 73$
    $m\angle 7 = 3(47) - 34 = 107$
    $\underline{m\angle 8 = m\angle 6 = 73°}$ (vert. ∠s thm.)