CV | Geometry
Mid Chapter 2 Review

NAME Key

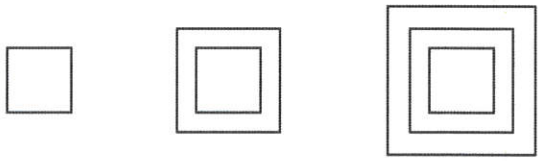
Write a conjecture that describes the pattern in each sequence. Then use your conjecture to find the next item in the sequence.

1. 5, 5, 10, 15, 25, …

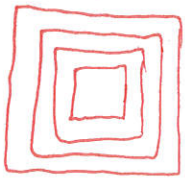
To get each term you add the two previous terms.

40

2.



To get the next figure you add a square outside the previous figure



Find a counterexample to show that each conjecture is false.

3. If AB = BC, then B is the midpoint of $\overline{AC}$.

False; A, B, and C do not have to be collinear.

4. If n is a real number, then $n^3 > n$.

When n is 1, the conjecture is false, since $1^3 > 1$.

Use the following statements to write a compound statement for each conjunction or disjunction. Then find its truth value. Explain your reasoning.

p: **A dollar is equal to 100 cents.**

q: **There are 4 quarters in a dollar.**

r: **February is the month before January.**

5. *p* ^ *r* A dollar is equal to 100 cents and February is the month before January.
False; February is after January.

6. *p and q* A dollar is equal to 100 cents. and There are 4 quarters in a dollar.
True;

7. *p* ^ ~*r*
A dollar is equal to 100 cents and February is not the month before January.
True

Identify the hypothesis and conclusion of each conditional statement.

8. If a polygon has five sides, then it is a pentagon.

H: A polygon has five sides.

C: it is a pentagon

9. If $4x - 6 = 10$, then $x = 4$.

H: $4x-6=10$

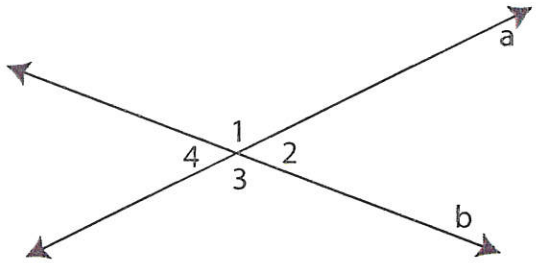
C: $x=4$

10. An angle with a measure less than 90 is an acute angle.

H: An angle has a measure less than 90

C: It is an acute Angle

Determine the truth value of each conditional statement. If true, explain your reasoning. If false, give a counterexample.



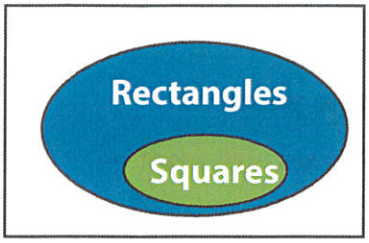
11. ∠1 and ∠2 are supplementary angles.

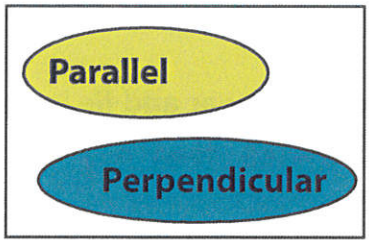
True; ∠1 + ∠2 are a linear pair.

12. ∠1 and ∠4 are congruent angles.

False; ∠1 + ∠4 form a linear pair but are not congruent.
∠1 + ∠3 would be congruent.

Use the Venn diagrams below to determine the truth value of each conditional. Explain your reasoning.





13. If a polygon is a square, then it is a rectangle.

True; All squares are rectangles

14. If two lines are perpendicular, then they cannot be parallel.

True; According to the diagram there is no overlap between two lines being parallel and two lines being perpendicular.

15. The Indianapolis Colts played Chicago Bears in the 2007 Super Bowl. Determine whether the stated conclusion is valid based on the given information. If not, write invalid. Explain your reasoning.

Given: The Super Bowl winner has the highest score at the end of the game. The Colts had a score of 29 and the Bears had a score of 17.

Conclusion: The Colts won the Super Bowl.

Valid; the Colts had the highest score in the Super Bowl. The team with the highest score is the winner, therefore the Colts won the Super Bowl.

16. Determine which statement follows logically from the given statements.

(1) If you are a junior in high school, then you are at least 16 years old.

(2) If you are at least 16 years old, then you are old enough to drive.

A. If you are old enough to drive, then you are a junior in high school.

B. If you are not old enough to drive, then you are a sophomore in high school.

C. If you are a junior in high school, then you are old enough to drive.

D. No valid conclusion possible.

Determine whether each statement is always, sometimes, or never true. Explain your reasoning.

17. Points J, K, L, and N are non-collinear and lie in the same plane M.

Sometimes; Postulate 2.4 states that a plane contains at least 3 noncollinear points.

18. There is exactly one line through points R and S.

Always; Postulate 2.1 states through any two points, there is exactly one line.

19. Line a contains only point Q.

Never; Postulate 2.3 states a line contains at least two points.

Write the converse, inverse, and contrapositive of each true conditional statement. Determine whether each related conditional statement is true or false. If a statement is false, find a counterexample.

20. If you live in Chicago, then you live in Illinois.

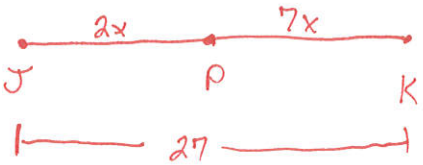
Converse: If you live in Illinois, then you live in Chicago.
False, You can live in Springfield.

Inverse: If you do not live in chicago, then you do not live in Illinois
False, You can live in Springfield.

Contrapositive: If you do not live in Illinois, then you do not live in Chicago;
True

Find the value of the variable if P is between J and K.

21. JP = 2x, PK = 7x, JK = 27

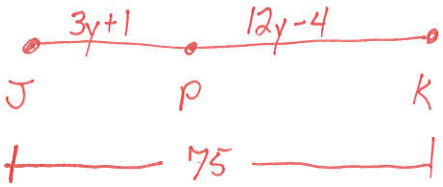


$2x + 7x = 27$

$9x = 27$

$\boxed{x = 3}$

22. JP = 3y + 1, PK = 12y – 4, JK = 75



$3y + 1 + 12y - 4 = 75$

$15y - 3 = 75$

$15y = 78$

$\boxed{y = 5.2}$