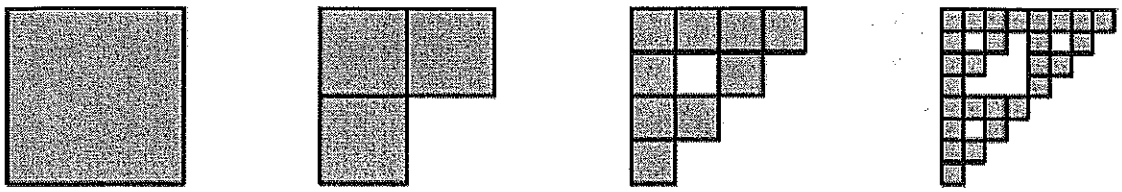
AD Geometry
Test Review – Logic and Algebra Review

Name: KEY
Date:_____ Period:____

1. The first 4 stages of certain fractal are shown below.



Stage 1 Stage 2 Stage 3 Stage 4

In each stage after the first, each square is divided into 4 squares, and then the bottom right square is removed.

If the pattern continues, which expression can be used to find the number of shaded square units Stage n contains?

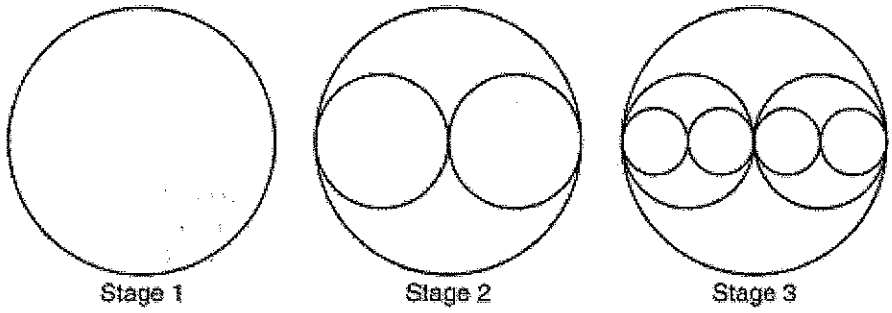
x	y
1	1
2	3
3	9
4	27

A.) $3n$ C.) n^3

B.) 3^n D.) 3^{n-1}

2. The figure below shows the first 3 stages of a fractal.

How many circles will the *n*th stage of this fractal contain?



Stage 1 Stage 2 Stage 3

x	y
1	1
2	3
3	7

A.) $2n$ C.) 2^n

B.) $2n-1$ D.) 2^n-1

3. The table below shows information about a pattern of regular polygons with certain numbers of sides. If the pattern continues, what is the perimeter of a regular polygon with 8 sides?

Sides	Perimeter
3 x 10	30 cm
4 x 9	36 cm
5 x 8	40 cm
6 x 7	42 cm
7 x 6	
8 x 5	

A.) 40 C.) 48

B.) 44 D.) 80

4. $6x+8+2(4x-2)+2(8x+21-(6x+5))=180$

$6x+8+2(4x-2)+2(8x+21-6x-5)=180$

$6x+8+8x-4+2(2x+16)=180$

$14x+4+4x+32=180$

$18x+36=180$

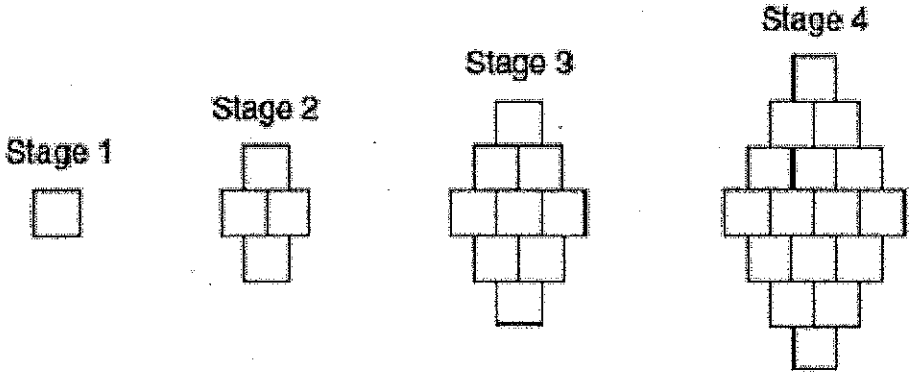
$18x=144$

$x=$

A.) x=8 C.) x=4

B.) x=6 D.) x= 7

5. The blocks below are arranged in sequence to show a pattern.



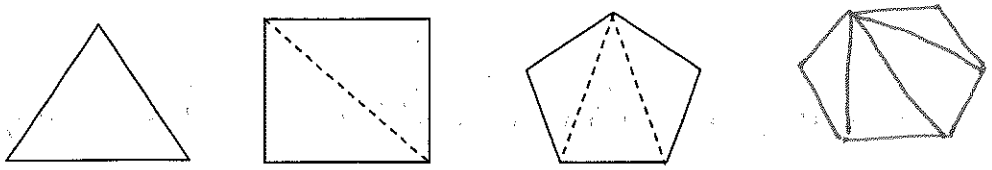
x	y
1	1
2	4
3	9
4	16

Which expression can be used to determine the number of blocks at Stage *n*?

A.) $\sqrt{n}$ C.) 2n

B.) n^2 D.) (n-1)+1

6. Draw the next picture in the sequence.



7. Write the following statement as a conditional and identify the hypothesis and conclusion.

Every Geometry student has a project to complete.

If you are a geometry student, then you have a project to complete

8. Write the following statement as a conditional and identify the hypothesis and conclusion.

An angle of 40° is acute

If an angle is 40°, then it is acute.

9. Truth Value. Tell whether the statement is true or false. If false, give a counter example.

If you are a senior, then you will graduate this year.

False, do not have enough credits

10. From the given statement write the conditional (when necessary) and converse. Then give the truth value of the converse, if false give a counter example

An angle that measures 95° is not acute

12. Conditional: If an angle measures 95°, then it is not acute
*don't forget to identify the hypothesis and conclusion.

13. Converse: If an angle is not acute, then it measures 95°

14. Truth Value (of the converse) F

15. Counter example (if number 14 is false) 100°

16. Identify the hypothesis and conclusion:

If it is the 4th of July (in the U.S.) then it is a holiday.

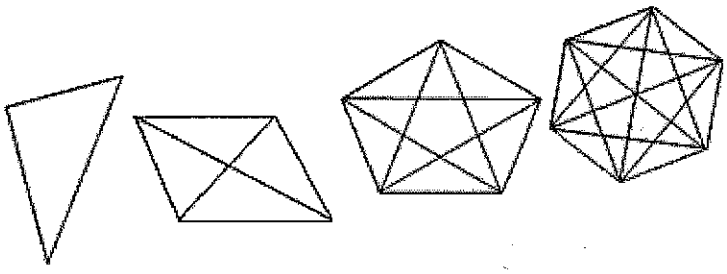
17. Converse: If it is a holiday, then it is the 4th of July (in the U.S.)

18. Truth Value (of the converse): F

19. Counter example: (if number 18 is false) Christmas

20. Use the geometric and numeric pattern below to develop an algebraic expression to answer the following question.

What is the total number of diagonals in a dodecagon?



x	y
3	0
4	2
5	5
6	9

Polygon	Triangle	Quadrilateral	Pentagon	Hexagon		*n-gon*
Total # of diagonals	0	2	5	9		

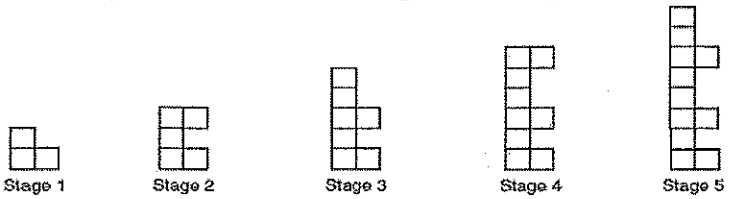
A.) $2n-6$

C.) $n(n-3)$

B.) $\frac{n(n-3)}{2}$

D.) $\frac{n(2n-6)}{2}$

21. The squares below are arranged in a sequence to show a pattern.



The table below shows the perimeter of each figure formed by the squares in the five pattern stages.

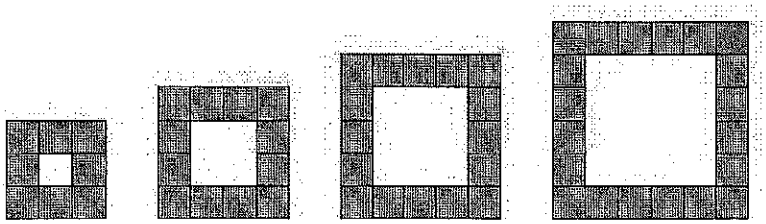
Stage, n	Perimeter, P (units)
1	8
2	12
3	16
4	20
5	24

Each side of a square represents 1 unit. If this pattern were to continue, which expression could be used to determine the perimeter of the figure at stage n ?

A.) n^2+7 C.) $2(n^2+3)$

B.) $4(n+1)$ D.) $-2(n-1)+8n$

22. The shaded squares below are arranged in a sequence to show a pattern.



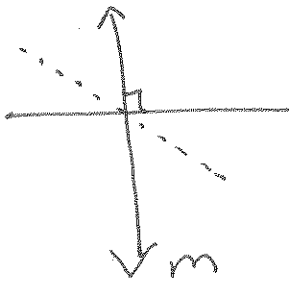
If the pattern continues, which expression can be used to find the number of shaded squares in the nth Stage?

A.) n+4 C.) 4(n+1)

B.) 4n+1 D.) 2(n+3)

x	y
1	8
2	12
3	16
4	20

23. Write and **illustrate** a counterexample to disprove the statement, "If two lines are perpendicular to the same line, they are always parallel to each other."



Geometry
Review Cont'd Logic & Algebra Review

Name_____
Date_____ Period____

Solve for x. Show all your work and box your answer to receive full credit:

24.) $\frac{6}{11} \cdot \frac{11}{6}x = 12 \cdot 11$

$\frac{6x}{6} = \frac{132}{6}$

$x = 22$

25.) $5 \cdot \frac{x+2}{5} = 3 \cdot 5$

$x + 2 = 15$

$-2 \quad -2$

$x = 13$

26.) $5(2x-6)+3x=12$

$10x - 30 + 3x = 12$

$13x - 30 = 12$

$+30 \quad +30$

$\frac{13x}{13} = \frac{42}{13}$

$x = \frac{42}{13}$

Use the given statement to answer the following questions.

"December is the last month of the year."

27.) What is the conditional statement? $p \rightarrow q$

If it is December, then it is the last month of the year

28.) What is the converse statement? $q \rightarrow r$

If it is the last month of the year, then it is December

29.) What is the contrapositive (the negated converse)? not $q \rightarrow$ not p

If it is not the last month of the year, then it is not December

30.) What is the inverse (the negated conditional)? not $p \rightarrow$ not q

If it is not December, then it is not the last month of the year

31.) What is the bi-conditional statement? if and only if

It is December if and only if it is the last month of the year

32.) What is the converse of the following conditional statement?: "If it is the last month of the year, then it is December."

If it is December, then it is the last month of the year.

Give truth value of conditional and converse

True and true

What is the inverse?

If it is not the last month of the year, then it is not December.

What is the truth value of the inverse? T

Find the 6th and 7th term in the pattern:

76, 106, 33.) 136, 166

1, 6, 16, 31, 51, ..., ...

+5 +10 +15 +20 +25 +30

-3072, 12,288, 34.) -49,152, 196,608

3, -12, 48, -192, 768, ..., ...

×-4 ×-4

_____ 35.) 2, 6, 8, 14, 22, 36, ...

14+22=36

22+36=58

36.) Use Law of Syllogism to make a Conclusion

If you read a good book, then you enjoy yourself

If you enjoy yourself, then your time is spent well.

Conclusion: If you read a good book, then your time is spent well.

37.) Use Law of detachment to make a conclusion.

If there is lightning, then it is not safe to be out in the open.

Marla sees lightning from the soccer field.

Conclusion: It is not safe for Marla to be on the soccer field.