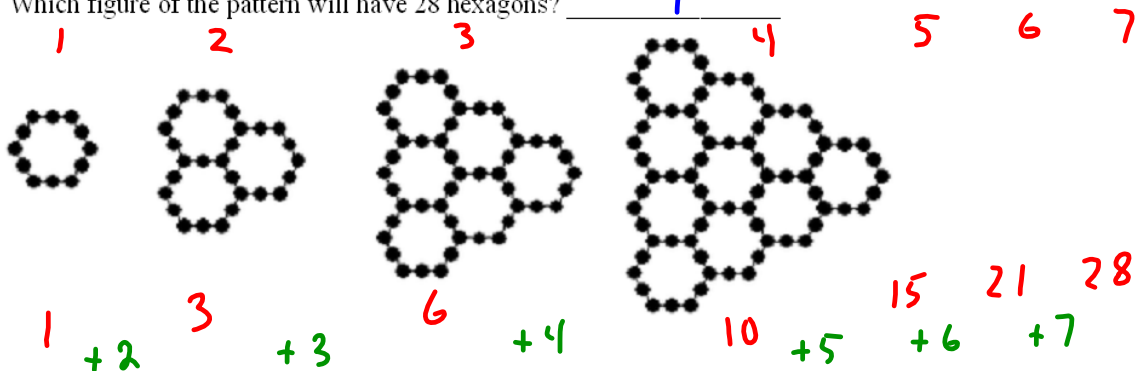


1. The hexagon below is surrounded by 12 dots.

a. How many hexagons will be in the 5th figure of the pattern? 15

b. Which figure of the pattern will have 28 hexagons? 7



2. Write the next three numbers in the pattern.

10, 15, 21, 28, 36, 45, 55

+5 +6 +7 +8 +9 +10

3. Fill in the missing numbers in the pattern.

2, 4, 8, 16, 32, 64

x2

4. Find a counterexample to disprove the conjecture;

The value of x^3 is always greater than the value of x .

1 $x^3 > x$
~~1~~ ~~0 > 0~~
~~-1~~ ~~-1 > -1~~

5. Find the counterexample to disprove the conjecture.

Regular polygons always have an even number of sides.

Regular Pentagon $(\frac{1}{2})^3 > \frac{1}{2}$
 $\frac{1}{8} > \frac{1}{2}$

6. Find the counterexample to disprove the conjecture.

If $x > 5$, then $x > 10$.

T F 6

> 5 and < 10

7. Rewrite the statements as biconditional. combines 2 if-thens w/ iff

If Chris is elected class president, then he has the most votes.
 If Chris has the most votes, then he will be elected class president.

Chris will be elected as president if and only if he has the most votes.

8. Which statement is the reflexive property, symmetric property, or transitive property.

If $\overline{AB} \cong \overline{CD}$, then $\overline{CD} \cong \overline{AB}$. Symmetric prop.

$\angle P \cong \angle P$ reflexive prop.

If $\angle 6 \cong \angle 7$ and $\angle 7 \cong \angle 8$, then $\angle 6 \cong \angle 8$. transitive prop.

9. Solve the equation and write a reason for each step.

$6(x+4) = 60$

given

$6x+24=60$

distributive

$6x=36$

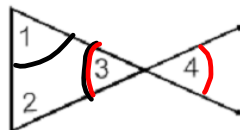
subtraction

$x=6$

division

10.

GIVEN: $\angle 1 \cong \angle 3$



PROVE: $\angle 1 \cong \angle 4$

Statements	Reasons
$\angle 1 \cong \angle 3$	given
$\angle 3 \cong \angle 4$	Vertical Angles
$\angle 1 \cong \angle 4$	Transitive property (Law of Syllogism)

:f $a=b$ then $b=a$

11. If $\overset{p}{x=3}$ then $\overset{q}{2x+4=10}$.

converse: $\text{If } 2x+4=10 \text{ then } x=3$ $q \Rightarrow p$

inverse: $\text{If } x \neq 3 \text{ then } 2x+4 \neq 10$ $\sim p \Rightarrow \sim q$

contrapositive: $\text{If } 2x+4 \neq 10 \text{ then } x \neq 3$ $\sim q \Rightarrow \sim p$

\sim (NOT)

\sim Negation

12. Solve the following equations for y.

a.) $-4x + 2y = 16$

$$\overset{4x}{2y} = \overset{4x}{\frac{16}{2}} + \frac{4x}{2}$$

$$y = 8 + 2x$$

b.) $4y + 12x = 40$

$$\frac{4y}{4} = \frac{40}{4} + \frac{-12x}{4}$$

$$y = 10 + -3x$$

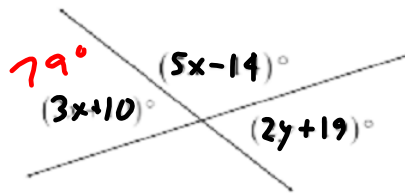
13. Find the values of x and y. (circle answers)

$$3x + 10 + 5x - 14 = 180$$

$$8x - 4 = 180$$

$$8x = 184$$

$$x = 23$$



$$2y + 19 = 3(23) + 10$$

$$2y + 19 = 69 + 10$$

$$2y = 79$$

$$2y = 60$$

$$y = 30$$

$$3x + 10$$

$$3(23) + 10$$

$$69 + 10$$

$$79$$

$$79 = 2y + 19$$

$$\begin{array}{r} -19 \\ \hline 60 = 2y \\ \frac{60}{2} = \frac{2y}{2} \\ 30 = y \end{array}$$

14. If $\angle A$ and $\angle B$ are vertical angles, and $\angle A = 7x + 3$ and $\angle B = 80^\circ$. Find x.

$x = 11$

$$7x + 3 = 80$$

$$\begin{array}{r} -3 \\ \hline 7x = 77 \\ \frac{7x}{7} = \frac{77}{7} \\ x = 11 \end{array}$$

$\angle A = \angle B$

15. If a polygon is equilateral, then it has all congruent sides.

converse: If it has all congruent sides, then a polygon is equilateral.
 inverse: If a polygon isn't equilateral, then it doesn't have all congruent sides.
 contrapositive: If it doesn't have all congruent sides, then a polygon isn't equilateral.

$$p \Rightarrow q$$

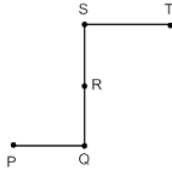
$$q \Rightarrow p$$

$$\sim p \Rightarrow \sim q$$

$$\sim q \Rightarrow \sim p$$

16.

GIVEN: $\overline{PQ} \cong \overline{RS}$,
R is the midpoint of \overline{SQ}



PROVE: $\overline{PQ} \cong \overline{QR}$

Statements	Reasons
$\overline{PQ} \cong \overline{RS}$, R is the midpoint of \overline{SQ} $\overline{SR} = \overline{RQ}$ $\overline{PQ} \cong \overline{QR}$	Given definition of a midpoint transitive prop.

IF - then form

17. Write the following statement as a conditional: Every rectangle has four right angles..

If it is a rectangle then it has 4 right \angle s.

18. Make a valid conclusion given the two statements (if possible).

a.) If you order ^P apple pie, then it will be served with ^Q ice cream.
Joe ordered apple pie.

$P \Rightarrow Q$
P
 $\therefore Q$

Joe's apple pie was served with ice cream

b.) If you eat too much ^P turkey, then you will get sick.
Abby got sick.

^Q NO CONCLUSION!!!

c.) If angle 2 is acute, then angle 3 is obtuse.
If angle 3 is obtuse, then angle 4 is acute.

19. True/False

a.) Through any 3 points there is exactly one line. F

b.) The intersection of two planes is a line. T

c.) Two lines can intersect in more than one point. F