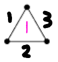
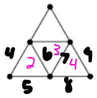
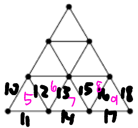
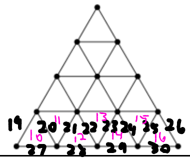
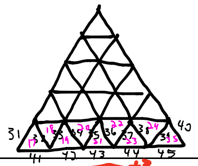
Geometry Chapter 2 Review

Name Key

1. Find the next two numbers in the pattern. Then describe the pattern.
   100, −50, 25, −12.5, …, 6.25, −3.125
   Start with 100, then divide previous number by −2

2. Each figure consists of triangles constructed from unit segments connecting each point.

   a. Fill out the rest of the chart

Figure	1	2	3	4	5	6	7	8
Picture						+3	+3	
Number of Unit Segments	3	+6 +3 9	+9 +3 18	+12 +3 30	+15 +3 45	+18 63	+21 84	+24 108
Number of Unit Triangles	1	+3 +2 4	+5 +2 9	+7 +2 16	+9 +2 25	+11 +2 36	+13 +2 49	+15 64

   b. Describe the pattern for the number of unit segments.
   Start with 3. Start by adding 6 to previous number. Add 3 to the amount added each time.

   c. Describe the pattern for the number of unit triangles
   Start with 1. Start by adding 3 to previous number. Add 2 to the amount added each time.

   d. Find the number of unit segments and unit triangles in the 8th figure.
   108 64

3. Use the following conditional statement: An angle is obtuse if it measures 130°.

   a. Rewrite the statement in if-then form. (Hint: the hypothesis already follows "if")
   If an angle measures 130°, then it is obtuse.

   b. Underline the hypothesis (condition) and circle the conclusion in your statement above.

   c. Is your if-then statement true or false? If false, then provide a counterexample.
   True

4. Use the following if then statement: If *x* equals 3, then *x* is greater than 2.

   a. Write the converse statement.
   If x is greater than 2, then x equals 3.

   Is the converse true or false? If false, then provide a counterexample.
   False. X could be 4, which is greater than 2, but not equal to 3.

   b. Write the inverse statement.
   If x is not equal to 3, then x is not greater than 2.

   Is the inverse true or false? If false, then provide a counterexample.
   False. X could be 4 which is not equal to 3, but is greater than 2.

   c. Write the contrapositive statement.
   If x is not greater than 2, then x is not equal to 3.

   Is the contrapositive true or false? If false, then provide a counterexample.
   True

5. Determine if each could be rewritten as a valid biconditional statement. (Hint: Are both the original and converse true?) If it can be rewritten as a valid biconditional statement, then write it as a biconditional statement

Converse: If 2 ∠'s = compl, then they add up to 90° ← true

a. If two angles add up to 90°, then the two angles are complementary. ← original = true [✓ Yes] or No
original and converse true

If yes, then rewrite as a biconditional:

Two angles add up to 90° if and only if they are complementary

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Converse: If a polygon is equilateral, then it is regular. ← False, you don't know if all ∠'s are ≅

b. If a polygon is regular, then the polygon is equilateral. ← original = true Yes or [✓ No]
converse false

If yes, then rewrite as a biconditional:

Converse: If a number is divisible by 2, then it is divisible by 4 ← False, 6 is divisible by 2, but not divisible by 4

c. If a number is divisible by 4, then the number is divisible by 2. ← original = true Yes or [✓ No]
converse false

If yes, then rewrite as a biconditional:

Converse: If x+5=7, then x+1=3 ← True (x=2 for both)

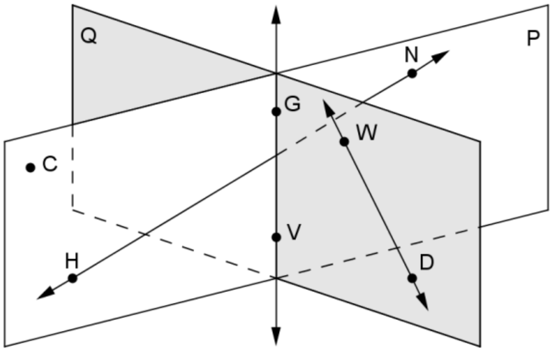
d. If $x + 1 = 3$, then $x + 5 = 7$. ← original = true (x=2 for both) [✓ Yes] or No
original and converse true

If yes, then rewrite as a biconditional:

$x+1=3$ if and only if $x+5=7$

6. Planes P and Q intersect as shown. Points W and D lie in Plane Q. Points C, H, and N lie in Plane P. True or False

a. C, H, and D are coplanar. [✓ T] or F
b. The intersection of Planes P and Q is $\overleftrightarrow{GV}$. [✓ T] or F
c. $\overleftrightarrow{HN}$ is in Plane Q. T or [✓ F]
d. $\overleftrightarrow{WD}$ and $\overleftrightarrow{HN}$ intersect. T or [✓ F]
e. $\overleftrightarrow{CN}$ exists. [✓ T] or F
f. V, G, N, and W are coplanar. T or [✓ F]
g. $\overleftrightarrow{HN}$ and $\overleftrightarrow{GV}$ intersect. [✓ T] or F



7. Solve the equation and state a reason for each step.

Statement	Reason
1. $6x - 4(x - 3) = 18 - x$	1. Given
2. $6x - 4x + 12 = 18 - x$	2. Distributive Property
3. $2x + 12 = 18 - x$ $+x \qquad +x$	3. Simplify
4. $3x + 12 = 18$ $-12 \quad -12$	4. Addition Property of Equality
5. $\frac{3x}{3} = \frac{6}{3}$	5. Subtraction Property of Equality
6. $x = 2$	6. Division Property of Equality

8. Write an equation and solve for the indicated value. Explain your reasoning including any theorems, definitions, or postulates used in **WRITING** the equations.

a. Given $m\angle EAG = 162°$ solve for x.

Equation and solution:

$3x - 4 + 8x + 1 = 162$

$11x - 3 = 162$

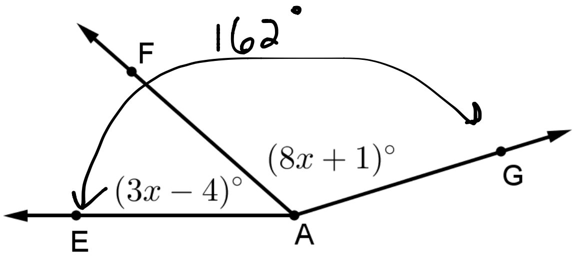
$+3 \quad +3$

$11x = 165$

$\frac{11x}{11} = \frac{165}{11} \rightarrow \boxed{x = 15}$

Reason for equation setup:

Angle Addition Postulate



b. Given the diagram, solve for x and y.

Equations and solutions

$13x + 50 = 180$

$-50 \quad -50$

$13x = 130$

$\frac{13x}{13} = \frac{130}{13}$

$\boxed{x = 10}$

$\frac{2y}{2} = \frac{50}{2}$

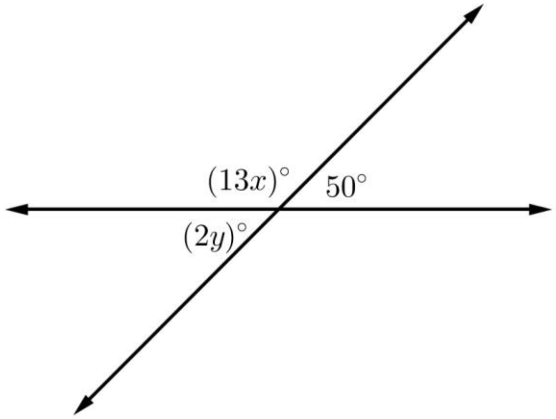
$\boxed{y = 25}$

Reason for equations setup:

Linear Pair Postulate

Definition of Supplementary

Vertical Angles Theorem



Complete each proof.

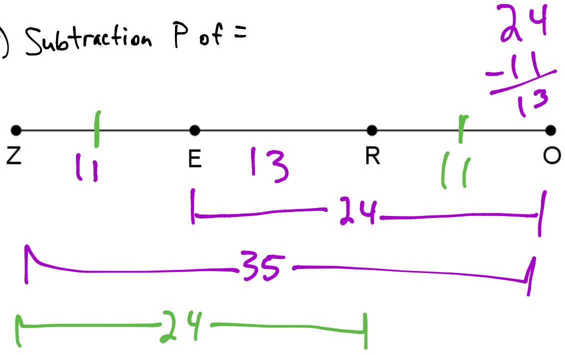
9. Given: ∠1 and ∠2 are complementary, $m\angle 1 = 67°$

Prove: $m\angle 2 = 23°$

Statements	Reasons
1) ∠1 and ∠2 are complementary	1) Given
2) $m\angle 1 = 67°$	2) Given
3) $m\angle 1 + m\angle 2 = 90°$	3) Definition of Complementary
4) $67° + m\angle 2 = 90°$ $-67° \quad -67°$	4) Substitution P of =
5) $m\angle 2 = 23°$	5) Subtraction P of =

10. Given: $\overline{ZE} \cong \overline{RO}$; $RO = 11$; $ZR = 24$

Prove: $EO = 24$



See next page for proof

Option 1

Statements	Reasons
1) $\overline{ZE} \cong \overline{RO}$	1) Given
2) $\overset{a}{ZE} \overset{=}{=} \overset{b}{RO}$	2) Def. of ≅ Segments
3) $\overset{b}{RO} \overset{=}{=} \overset{c}{11}$	3) Given
4) $\overset{a}{ZE} \overset{=}{=} \overset{c}{11}$	4) Transitive P of =
5) $ZE + ER = ZR$	5) Segment Addition Postulate
6) $ZR = 24$	6) Given
7) $\underset{-11}{11} + ER = \underset{-11}{24}$	7) Substitution P of =
8) $ER = 13$	8) Subtraction P of =
9) $EO = ER + RO$	9) Segment Add. Post
10) $EO = 13 + 11$	10) Substitution P of =
11) $EO = 24$	11) Combine Like Terms

Option 2

Statements	Reasons
1) $\overline{ZE} \cong \overline{RO}$	1) Given
2) $ZE = RO$	2) Def. of ≅ Segments
3) $EO = ER + RO$	3) Segment Add. Post.
4) $\overset{a}{EO} \overset{=}{=} \overset{b}{ER + ZE}$	4) Substitution Pof =
5) $\overset{b}{ER + ZE} \overset{=}{=} \overset{c}{ZR}$	5) Seg. Add. Post.
6) $\underset{a}{\overset{a}{EO}} \underset{=}{\overset{=}{=}} \underset{b}{\overset{c}{ZR}}$	6) Transitive Pof =
7) $\underset{b}{ZR} \underset{=}{=} \underset{c}{24}$	7) Given
8) $\underset{a}{EO} \underset{=}{=} \underset{c}{24}$	8) Transitive Pof =