

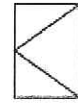
Review of Standards 5 & 6

Name: **KEY**

(1) Use inductive reasoning to determine the next number/figure of the pattern.

a) 24, 12, 6, 3, **1.5**

b)



(2) Here is a statement: **Collinear points are coplanar.** Using that statement, do the following:

If points are collinear, then they are coplanar. a) Write the statement in "if-then" form.

If points are coplanar, then they are collinear. b) Write the converse of the statement.

Points are collinear iff they are coplanar. c) Write the statement as a biconditional.

NO. The biconditional is not true. d) Is the original statement a definition? Why?

(3) Make a logical conclusion if possible. (If you can't make a correct logical conclusion, write N.C.P.)

"If Julie is not happy, then it is Monday."

No Conclusion Possible a) Today is Monday.

It is Monday. b) Julie is not happy.

No Conclusion Possible c) Julie is happy.

(4) Use your knowledge of logically equivalent statements to reach a logical conclusion in each of the following if possible. Here's what you are given as true:

"If purple fish can fly, then Julie isn't happy." \equiv **If Julie is happy, then purple fish cannot fly.**

Purple fish cannot fly. a) Julie is happy.

No Conclusion Possible b) Nemo is a non-purple fish.

No Conclusion Possible c) Julie is not happy.

(5) Use the blank on the left to answer whether the given statement is true or false; use the blank on the right to answer whether its converse is true or false:

statement	converse
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<u>T</u>	<u>F</u>	a. If two angles are adjacent angles, then they share a common vertex.
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<u>F</u>	<u>T</u>	b. If three points are coplanar, then they are collinear.
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<u>F</u>	<u>T</u>	c. If an angle is not an acute angle, then it is obtuse
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<u>T</u>	<u>T</u>	d. If two lines meet to form congruent adjacent angles, then they are perpendicular.
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(6) Use your knowledge of logically equivalent statements to decide whether each of the following is true or false, or NCP (no conclusion possible). Here's what you are given as true about the aliens known as snarks:

"All snarks have three red threads." *If an alien is a snark, then it has 3 red threads.*

NCP a) If an alien is not a snark, then it doesn't have three red threads. *INVERSE*

T b) If an alien doesn't have three red threads, then it isn't a snark. *CONTRAPOSITIVE*

NCP c) If an alien does have three red threads, then it is a snark. *CONVERSE*

T d) If an alien is a snark, then it has three red threads. *CONDITIONAL*

(7) Use the Law of Detachment to reach a conclusion if possible.

a) If $x > 0$, then it is called a positive number.
 $x = -2$.

Conclusion: *No conclusion possible*

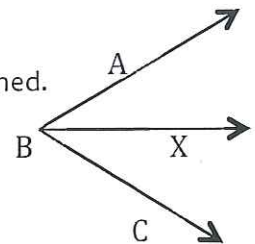
b) If you love apples, then you love apple flavored candy.
 Cindy loves apple flavored candy.

Conclusion: *No conclusion possible*

c) If a polygon is a square, then it has four sides.
 Polygon ABCD has four sides.

Conclusion: *Polygon ABCD is not a square.*

d) If a ray is the angle bisector of an angle, then two angles of equal measure are formed.
 In the figure, \overrightarrow{BX} bisects $\angle ABC$.



Conclusion: *$m\angle ABX = m\angle XBC$*

(8) Use the Law of Syllogism to reach a conclusion if possible.

a) If Jimmy plays the violin, then he will have quick fingers.
 If Jimmy has quick fingers, then he can chat on AIM really fast.
 If Jimmy can chat on AIM really fast, then he will make tons of new friends.

Conclusion: *If Jimmy plays the violin, then he will make tons of new friends.*

b) If animals are furry, then they are sweet.
 If animals are sweet, then they will sit in your lap.
 If an animal is a lion, then it is furry.

Conclusion: *If an animal is a lion, then it will sit on your lap.*

(9) Write each of the following definitions as a biconditional:

Linear Pair: Two angles form a linear pair iff they are adjacent and their uncommon sides form opposite rays.

Right Angle: An angle is a right angle iff its measure is 90° .

(10) Write the contrapositive of "Lines aren't skew if they are coplanar." \equiv If lines are coplanar, then they are not skew.

CONTRAPOSITIVE: If lines are skew, then they are not coplanar.

(11) Come up with your own truth table for the following comparison: $\sim(p \wedge q) \equiv (\sim p \vee \sim q)$

p	q	$\sim p$	$\sim q$	$p \wedge q$	$\sim(p \wedge q)$	$\sim p \vee \sim q$	$\sim(p \wedge q) \equiv (\sim p \vee \sim q)$
T	T	F	F	T	F	F	T
T	F	F	T	F	T	T	T
F	T	T	F	F	T	T	T
F	F	T	T	F	T	T	T

(12) Given the statement "If lines are perpendicular, then they intersect." Answer the following:

- What is the hypothesis? lines are perpendicular
- What is the conclusion? they intersect
- Write the converse. If lines intersect, then they are perpendicular.
- Write the inverse. If lines are not perpendicular, then they do not intersect.
- Write the contrapositive. If lines do not intersect, then they are not perpendicular.
- Which of the statements in problems c – e are true? just (d)

(13) Suppose you are given that $p \Rightarrow \sim q$. From that information, identify the type of statement which follows:

contrapositive $q \Rightarrow \sim p$ inverse $\sim p \Rightarrow q$

(14) Complete the following truth table:

p	q	$\sim p$	$\sim q$	$p \rightarrow q$	$\sim q \rightarrow \sim p$	$(p \rightarrow q) \Leftrightarrow (\sim q \rightarrow \sim p)$
T	T	F	F	T	T	T
T	F	F	T	F	F	T
F	T	T	F	T	T	T
F	F	T	T	T	T	T

* this shows the conditional $(p \rightarrow q)$ and the contra. $(\sim q \rightarrow \sim p)$ are logically equivalent.