Name Answers Date

5.6 – Indirect Proofs (Part 1)

Write the first step of an indirect proof of the given statement.

1) A number g is divisible by 2.

Assume temporarily that a number g is not divisible by 2.

2) There are more than three red houses on the block.

Assume temporarily that there are only 3 red houses on the block.

3) ΔABC is equilateral.

Assume temporarily that ΔABC is scalene.

4) $m\angle B \cong 90$

Assume temporarily that $m\angle B \neq 90$

5. $\angle C$ is not a right angle.

Assume temporarily that $\angle C$ is a right angle.

6) There are less than 15 pounds of apples in the basket.

Assume temporarily that there is exactly 15 lbs of apples.

7) If the number ends in 4, then it is not divisible by 5.

Assume temporarily, if the number ends in 4, then it is divisible by 5.

8) If $\overline{MN} \cong \overline{NO}$, then point N is on the perpendicular bisector of $\overline{MO}$.

Assume temporarily, if $\overline{MN} \cong \overline{NO}$, the point N is not on the $\perp$ bis. of $\overline{MO}$

9) If two right triangles have congruent hypotenuses and one pair of congruent legs, then the triangles are congruent.

Assume temporarily ....., then the triangles are not congruent.

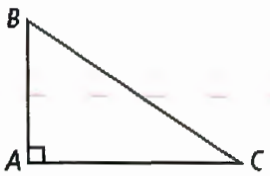
10) If two parallel lines are intersected by a transversal, then alternate interior angles are congruent.

Assume temporarily ....., then AIA are not congruent.

11) Fill in the blanks to prove the following statement: In right ΔABC, $m\angle B + m\angle C = 90$.

Given: right ΔABC

Prove: $m\angle B + m\angle C = 90$



Assume temporarily that $m\angle B + m\angle C$ ≠ 90. If $m\angle B + m\angle C$ ≠ 90, then $m\angle A + m\angle B + m\angle C$ ≠ 180. According to the Triangle Angle Sum Theorem, $m\angle A + m\angle B + m\angle C$ = 180. This contradicts the previous statement, so the temporary assumption is false.

Therefore, $m\angle B + m\angle C = 90$.

12) Use indirect reasoning to eliminate all but one of the following answers. In what year was In what year was Barack Obama born?

1809 1909 1961 2000

Identify the two statements that contradict each other.

13) I. ΔABC is acute. II. ΔABC is scalene. III. ΔABC is equilateral.

14) I. $m\angle B \leq 90$ II. $\angle B$ is acute. III. $\angle B$ is a right angle.

15) I. $\overline{FA} \parallel \overline{AC}$ II. $\overline{FA}$ and $\overline{AC}$ are skew. III. $\overline{FA}$ and $\overline{AC}$ do not intersect.

16) I. Victoria has art class from 9:00 to 10:00 on Mondays. II. Victoria has math class from 10:30 to 11:30 on Mondays. III. Victoria has math class from 9:00 to 10:00 on Mondays.

17) I. ΔMNO is acute. II. The centroid and the orthocenter for ΔMNO are at different points. III. ΔMNO is equilateral.

18) I. ΔABC such that $\angle A$ is obtuse. II. ΔABC such that $\angle B$ is obtuse. III. ΔABC such that $\angle C$ is acute.

19) I. The orthocenter for ΔABC is outside the triangle. II. The median for ΔABC is inside the triangle. III. ΔABC is an acute triangle.