

MATH 6: FINAL TEST

1. Write a truth table for the following formula:

$$(A \text{ OR } B) \text{ AND } (A \text{ OR } C)$$

2. Let $A = \{x|x \leq 2\}$ and $B = \{x|x > -2\}$. Find the following: $A \cap B$; $A \cup B$, and $A \setminus B$
3. Let $|A| = 10$, $|B| = 20$, $|A \cup B| = 25$. Find $|A \cap B|$
4. 10 students run the race. Top three are awarded gold, silver, and bronze medals, and the students who placed 4 and 5 are awarded a participation prize. How many different possibilities for awards are there?
5. How many different arrangements of the letters of the word ILLINOIS are there?
6. Describe how to find the angle bisector using straightedge and compass.
7. Calculate the following sum: $1 + 4 + 7 + \cdots + 97 + 100$.
8. Calculate the following sum: $1 + 3 + 9 + \cdots + 3^{10}$.
9. Solve the following inequality: $x(x - 5) \leq 0$.
10. A board 10×10 has a bottom left and top right corner cells removed. Can you tile it with 2×1 dominoes?
11. Draw a graph of the following function: $y = |x + 2| - 5$.