1. If $y$ is directly proportional to $x$ and if $y = 24$ when $x = 4$, what is the value of $y$ when $x = 7$?
   a. $\frac{6}{7}$  b. $\frac{24}{7}$  c. 27  d. 28  e. 42

2. For all positive integers $a$ and $b$, let the operation $\{\}$ be defined by $a\{b\} = a^{b+2} - 6a^b + 14$. For how many positive integers $a$ is $a\{2\}$ equal to 9?
   a. 0  b. 1  c. 2  d. 3  e. 4

3. In the figure at right, the line $l$ has a slope of $-2$. What is the $y$-intercept of $l$?
   a. 5  b. 8  c. 11  d. 13  e. 15

4. Which of the following numbers is divisible by 7 and 11 but not divisible by 10?
   a. 49  b. 66  c. 70  d. 308  e. 504

5. In the figure below right, the intersection of ray $AC$ with ray $BA$ is:
   a. Segment $AC$
   b. Segment $AB$
   c. Ray $AC$
   d. Ray $BA$
   e. Line $AC$

6. What is the greatest integer value of $x$ for which $4x - 28 < 0$?

7. The mean of a list of 87 consecutive integers is 33. What is the greatest integer in the list?
8. When a positive integer \( p \) is divided by 5 the remainder is 4. What is the remainder when \( 12p \) is divided by 10?

9. When a certain number is divided by \( \frac{1}{2} \) and the quotient is then multiplied by 9 the result is 108. What is the number?

10. The diameter of a circle is 5. If the circle is cut in half, what is the total perimeter of the two pieces?

Answers
1. E
2. B
3. C
4. D
5. B
6. 6
7. 77
8. 8
9. 6
10. \( 5\pi + 10 \)