Unit 1: Algebraic Expressions

I. Represent each word phrase with a variable expression.
   1. seven times the number $t$
   2. five less than the number $m$
   3. three more than the number $x$
   4. half of the sum of the number $y$ and four
   5. six times the difference of ten and a number $r$

II. Simplify the expressions.
   6. $3(2x - 5)$
   7. $-2(3t + s) + 7(t - 2)$
   8. $2(a + 3b) - 3(3a + b)$
   9. $5(x - 7) - (8 - x)$
   10. $2w + 2(w + 8)$
   11. $(x - 3)(x + 1)$
   12. $(2x + 3)(3x - 5)$
   13. $(x - y)(x^2 + xy + y^2)$
   14. $(a + b)^2$
   15. $(x + y + z)(x - y - z)$
III. Using the given variables, write an expression for each situation.

16. The area of a rectangle that has a length of 10 and a width of $w$.

17. Write an expression for the perimeter of the rectangle in #16.

18. The area of the rectangle that has a length that is 3 times its width, $w$.

19. Write an expression for the perimeter of the rectangle in #18.

20. The area of a rectangle whose width is 5 less than its length, $l$.

21. Write an expression for the perimeter of the rectangle in #20.

22. The perimeter of a soccer field whose length is 37 meters more than its width, $w$.

23. The total number of tickets sold if the number of adult tickets sold was 23 less than the number of child tickets, $c$.

24. Mario’s age if Mario is twice as old as Kelly’s age, $k$, was 3 years ago.

25. The amount of pay Rachel will earn in an 8 hour shift if Rachel earns $3 more per hour than Leah’s pay, $p$. 