**Unit 8 Test Extra Review Problems**
**Advanced Algebra**

Name: _____
Period: _____ Date: _____

***Fill in the general equation for each type of variation.***

1. Direct Variation
   y varies directly as x
   $y =$_____

2. Inverse Variation
   y varies inversely as x
   $y =$_____

3. Joint Variation
   y varies jointly as x and z
   $y =$_____

***State whether each equation represents a direct, inverse, or joint variation. State the constant of variation.***

4. $y = 2x$

5. $D = \frac{3}{4}gh$

6. $P = \frac{6}{v}$

7. $a = 9bc$

***Solve.***

8. Suppose y varies jointly with x and z. If y = 20 when x = 2 and z = 5, find y when x = 14 and z = 8.

9. Find y when x = 3, if y varies inversely as x and x = 4, when y = 16.

10. If y varies directly as x and y = -16 when x = 6, find y when x = 1.5

11. Find y when x = 4, if y varies directly as x and y = 7 when x = 1.5.

12. If y varies inversely as x and y = 2 when x = 8, find x when y = 14.

13. Find y when x = 12 and z = 2, if y varies jointly as x and z and y = 24 when z = 2 and x = 1.

***Simplify each expression.***

14. $\frac{x^2-4x}{x^5} \div \frac{x-4}{x^9}$

15. $\frac{x^9}{x^2-4x-12} \cdot \frac{x^2+2x}{x^7}$

16. $\frac{x-y}{9} \div \frac{x^2-y^2}{3}$

17. $\frac{x^2-y^2}{3x+12} \cdot \frac{x+4}{x+y}$

18. $\frac{5}{4x-4} + \frac{x-3}{x-1}$

19. $\frac{x+5}{x-2} - \frac{2}{3x-6}$

20. $\frac{6}{5x} - \frac{1}{3x} - \frac{2}{6x}$

21. $\frac{4}{2x} - \frac{2}{5x} - \frac{7}{10x}$

***Determine the equations of any vertical asymptotes.***

22. $f(x) = \frac{5}{(x-3)(x+4)}$

23. $f(x) = \frac{-2}{(x-2)(x-5)}$

***Solve the equations. Check for extraneous solutions.***

24. $\frac{2}{x-1} = 4 - \frac{x}{x-1}$

25. $\frac{13}{x+1} + \frac{x}{x+1} = 4$