Algebra I Quarter 3 Exam

Name/Student Number:_____

Score:_____/_____

Directions: *For each question show all work that is required to arrive at the solution. Save this document with your answers and submit as an attachment to be graded.*

Simplify each expression. Use positive exponents.

1. $m^3n^{-6}p^0$

2. $\frac{a^4b^{-3}}{ab^{-2}}$

3. $(x^{-2}y^{-4}x^3)^{-2}$

4. Write the explicit formula that represents the geometric sequence -2, 8, -32, 128

5. Evaluate the function $f(x) = 4 \cdot 7^x$ for $x = -1$ and $x = 2$. Show your work.

6. Simplify the quotient $\frac{4.5 \times 10^3}{9 \times 10^7}$. Write your answer in scientific notation. Show your work.

Simplify the expressions. Show your work.

7. $3x(4x^4 - 5x)$

8. $(5x^4 - 3x^3 + 6x) - (3x^3 + 11x^2 - 8x)$

9. $(x - 2)(3x\text{-}4)$

10. $(x + 6)^2$

Factor each expression. Show your work.

11. $r^2 + 12r + 27$

12. $g^2 - 9$

13. $2p^3 + 6p^2 + 3p + 9$

Solve each quadratic equation. Show your work.

14. $(2x - 1)(x + 7) = 0$

15. $x^2 + 3x = 10$

16. $4x^2 = 100$

17. Find the roots of the quadratic equation $x^2 - 8x = 9$ by completing the square. Show your work.

18. Use the discriminant to find the number of real solutions of the equation $3x^2 - 5x + 4 = 0$. Show your work.

A water balloon is tossed into the air with an upward velocity of 25 ft/s. Its height $h(t)$ in ft after t seconds is given by the function $h(t) = -16t^2 + 25t + 3$. Show your work.

19. After how many seconds will the balloon hit the ground? (hint: Use the quadratic formula)

20. What will the height be at $t = 1$ second