Algebra 2 – Test Review - Unit 6 Name _____

Part 1 – Do without using a calculator

1. Evaluate, you must show your work: (a) ${}_8C_3$ _____ (b) ${}_9C_2$ _____

2. Factor $m^3 - 64$ _____

3. Solve for all real and complex roots:

   A. $x^4 - 3x^2 - 28 = 0$ B. $x^3 - 125 = 0$

4. $y = 2x^3 - 8x^2 - 12x$

a) describe the end behavior _____

b) name the x-intercepts _____

c) graph the function

5. Write a polynomial in standard form with zeroes of 3, –1, and 4. _____

6. Divide using synthetic division: $(x^3 + 4x^2 - 6x - 6) \div (x + 3)$ _____

7. Factor completely:
   $x^3 + x^2 - 60x + 108$ (one of the zeroes is 2) _____

8. Solve by factoring: $6x^3 + 11x^2 - 35x = 0$ _____

9. Expand: $(a + b)^6$

For each problem 10-12, write the notation needed to solve (e.g. 5!, $_{10}P_6$, $_9C_8$). Then solve.

10. You are going to arrange 8 items. How many arrangements can be made?

_____ _____
notation solution

11. You are choosing 5 people from a group of 11. How many combinations of 5 people can be made?

_____ _____

12. There are eight colleges you are thinking about attending. You want to rank your top three choices. How many ways can you arrange the eight colleges in a group of three?

_____ _____

13. What is the formula that is used to find the x value that yields the maximum value of a quadratic function?

14. A parabola is translated up 5 units and right 6 units. What is the equation of the translated parabola?

Part 2 – You can use a calculator

15. A ballot for the position of Judge for the 3rd District Court of Appeals says to vote for up to 3 candidates. There are 8 people running for judge. How many possible combinations of candidates can be voted for?

16. There is an 80% chance of rain over the next 4 days. What is the probability it will rain on exactly three of the next four days?

17. Find the number of unique permutations: MATHHASCLASS

18. Using letters and the numbers 0-9, how many 4 character codes can be made? Letters and numbers can repeat.

Solutions:

1. a. 56 b. 36
2. $(m - 4)(m^2 + 4m + 16)$
3. A) $\pm\sqrt{7}, \pm 2i$ b) $5, \frac{-5 \pm 5i\sqrt{3}}{2}$
4. A) ↙↗ b) $0, 2 \pm \sqrt{10}$ c) graph goes through zeroes
5. $x^3 - 6x^2 + 5x + 12$
6. $x^2 + x + \frac{9}{x+3}$
7. $(x+9)(x - 6)(x - 2)$
8. Factors: $x(2x + 7)(3x - 5)$ solution: $0, -\frac{7}{2}, \frac{5}{3}$
9. $a^6 + 6a^5 b + 15a^4b^2 + 20a^3b^3 + 15a^2b^4 + 6ab^5 + b^6$
10. 8! 40, 320
11. ${}_{11}C_5$ 462
12. ${}_8P_3$ 336
13. $x = -\frac{b}{2a}$
14. $y = (x - 6)^2 + 5$
15. 93
16. 40.96%
17. 6,652,800
18. 1,679,616