N: D: P: 1 2 3 4 5 6

Algebra 2: Topic 4 // **Review Worksheet A** *Mission Hills Math 2013*

Directions: Calculators are not allowed. Show any work on a separate sheet of paper and attach. Express any imaginary answers in terms of "i".

Perform the indicated operation. Express your answer as a real or complex number.

1) $(4 - 6i) + (2 - i)$ 2) $(8 + 4i) + (6 - 2i)$ 3) $(7 + 3i) - (2 - 5i)$

4) $(2 - 6i) - (3 - 2i)$ 5) $6i(2i)$ 6) $(4 + i)(4 - i)$

7) $(2 + 5i)(3 - i)$ 8) $(6 + 2i)(1 + 5i)$ 9) $\frac{5}{2+i}$

10) $\frac{6}{3-2i}$ 11) $\frac{3+3i}{2+5i}$ 12) $\frac{4-2i}{1-4i}$

If $i = \sqrt{-1}$, find the value of each of the following:

13) i^2 14) i^3 15) i^4 16) i^5 17) i^{10} 18) i^{12}

Plot each of the following complex numbers on a single grid and label with the given letter.

19) A: 3 + 2i 20) B: -5 + i 21) C: 2 – 4i 22) D: -1 – 3i

Find the solutions to the following equations. Express any imaginary numbers in terms of "i".

23) $x^2 + 4x + 8 = 0$ 24) $3x^2 - 4 = 71$ 25) $x^2 - 2x - 24 = 0$ 26) $x^2 = 8x$

27) $x^2 + 36 = 0$ 28) $2x^2 - x + 5 = 0$ 29) $2x^2 + 3x - 5 = 0$

30) There are two numbers with the following properties.

1) The second number is 3 more than the first number.
2) The product of the two numbers is 9 more than their sum.

Which of the following represents possible values of these two numbers?

A) -6, -3 B) -4, -1 C) -1, 4 D) 4, 1

31) What are the zeros of the function f(x) = $x^2 - x - 12$?

32) What are the x-intercepts of the graph of $y = 3x^2 - 13x - 10$?

33) Determine the maximum value of the function f(x) = $-2(x-3)^2 + 4$.

34) Determine the minimum value of the function f(x) = $5(x+2)^2 + 3$.

35) What is the minimum point of y = $x^2 + 6x - 4$?

36) What is the maximum point of y = $-x^2 - 8x + 5$?

37) Write the equation y = $2x^2 - 20x + 1$ in the completed square form: y = $a(x-h)^2 + k$

38) If 0 < a < 1, how does the graph of $y = ax^2$ compare to the graph of $y = x^2$?

39) If a > 1, how does the graph of $y = ax^2$ compare to the graph of $y = x^2$?

40) If a < 0, how does the graph of $y = ax^2$ compare to the graph of $y = x^2$?

41) Describe the translation of the graph $y = (x+5)^2 + 2$ to the graph of $y = (x-1)^2 - 3$.

42) Describe the translation of the graph $y = (x-2)^2 - 1$ to the graph of $y = (x+6)^2 - 4$.

Problems 43 - 45: Given the following statements, which ones would be true for the following pairs of parabolas. More than one statement may be true.

A) Their vertices are maximums.
B) The graphs have the same shape with different vertices.
C) The graphs have different shapes with different vertices.
D) One graph has a vertex that is a maximum, while the other graph has a vertex that is a minimum.
E) Their vertices are minimums.

43) $y = -4(x+5)^2 - 3$ and $y = -4(x+5)^2 + 3$

44) $y = 2(x+8)^2 + 4$ and $y = -3(x+2)^2 + 1$

45) $y = 6(x+2)^2 - 7$ and $y = 6(x+1)^2 - 3$

46) The function f(x) = $(x-b)^2 + c$ is a parabola that opens upward with a minimum at the vertex point (-1, 6). Use this information to find the constants b and c.

49) Sketch a graph of $y = 2(x+2)^2 - 4$.

50) Sketch a graph of $y = -\frac{1}{2}(x-1)^2 + 3$.