Math 121 Fa13 Sections 2.1-2.5, 3.1, 3.3, 3.5, 4.1-4.6, 5.1-5.2

Name: _____ **TA:** _____

Exam 1 Form A

1.) Which of the following are **not** functions? (Choose all that apply) 1.) _____

A.) $\{(0,2),(1,3),(4,8),(5,2)\}$ C.) $\{(0,0),(1,2),(3,3)\}$

B.) $\{(3,5),(3,6),(3,7)\}$ D.) $\{(1,2),(3,4),(5,6)\}$

2.) For the given functions f and g, find the composition. 2.) _____

$f(x) = x^3 - 2x$; $g(x) = -2x$ Find $(f \circ g)(x)$.

A.) $-8x^3 - 4x$ B.) $-8x^3 + 4x$ C.) $-2x^3 + 4x$ D.) $-2x^3 - 2x$

3.) Find the domain of the function $h(x) = -\sqrt{-x-2}$ 3.) _____

A.) $(-\infty, -2)$ B.) $(-2, \infty)$ C.) $(-\infty, -2]$ D.) $[-2, \infty)$

Consider the function $f(x) = x^3 - 2x^2 + 16x + 12$

4.) What symmetry does f have? 4.) _____

A.) Even C.) Odd

B.) Neither D.) Both

5.) Using the Rational Roots Theorem, what are possible rational roots for f? 5.) _____

A.) $\pm 12, \pm 6, \pm 4, \pm 3, \pm 2, \pm 1$ C.) $\pm 16, \pm 8, \pm 4, \pm 2, \pm 1$

B.) $\pm 6, \pm 3, \pm 2, \pm 1$ D.) $\pm 8, \pm 4, \pm 2, \pm 1$

6.) Suppose a polynomial with real coefficients and degree 5 has zeros: $2, i, and\ 3 - 4i$. Find the other zeros. 6.) _____

A.) $-2,\ -3 - 4i$ B.) $-i,\ -3 - 4i$ C.) $-i,\ 3 + 4i$ D.) $-2,\ 3 + 4i$

7.) Consider the function $g(x) = -5(x - 2)^2 + 3$ 7.) _____
State the collection of transformations on $f(x) = x^2$ to get $g(x)$.

A.) Shift down 3, Shift down 2, Vertical stretch by 5, Flip about y-axis.

B.) Shift left 2, Shift up 3, Horizontal shrink by 1/5, Flip about x-axis.

C.) Shift up 3, Shift right 2, Horizontal stretch by 5, Flip about y-axis.

D.) Shift right 2, Shift up 3, Vertical stretch by 5, Flip about x-axis.

8.) Consider the function $f(x) = (x - 3)^4(x - 2)(x - 5)^3$. 8.) _____
Which of the following is **not** true?

A.) The graph crosses the x-axis at the zero x = 5.

B.) Near the zero x = 3, the function acts like the graph of $g(x) = 250(x - 3)^4$

C.) It has at most 7 turning points.

D.) $\lim_{x \to -\infty} f(x) = \infty$

Solve the Inequality

9.) $x^2 - x - 12 > 0$ 9.) _____

A.) $(-\infty, -3) \cup (4, \infty)$ B.) $(-\infty, -3] \cup [4, \infty)$ C.) $(-3,4)$ D.) $[-3,4]$

10.) $\frac{x-1}{x+2} \leq 0$ 10.) _____

A.) $(-\infty, -2) \cup [1, \infty)$ B.) $(-\infty, -2] \cup [1, \infty)$ C.) $[-2,1]$ D.) $(-2,1]$

11.) Consider the polynomial function 11.) _____
$f(x) = -4x^5 + 3x^3 - 2x^2 + 6x - 10.$
What is the end behavior of the graph?

12.) Graph $h(x) = \frac{(x-3)^2(x-1)}{(x-6)(x-1)(x+4)}$