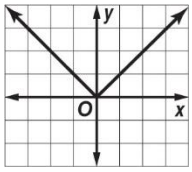
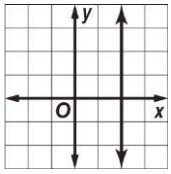
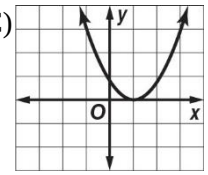
Pre-Calculus Extra Midterm Review: Units A & B

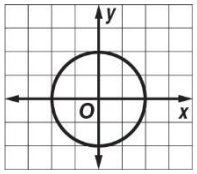
Chapter 1 (Unit A)

1. Which relation is a function? List all that apply.

A) 

B) 

C) 

D) 

2. Which results in the graph of $f(x) = \sqrt{x}$ being expanded vertically, and reflected in the x-axis, and shifted left 2?

F) $f(x) = -2\sqrt{x+2}$ G) $f(x) = -3\sqrt{x} + 2$ H) $f(x) = \sqrt{-3x+2}$ J) $f(x) = 3\sqrt{x-2}$

3. If $f(x) = x^2 + 1$ and $g(x) = \frac{1}{x}$, find $f(g(x))$.

4. Find the inverse of $f(x) = x^3 - 4$.

5. What type of discontinuity (if any) does each function have?

a. $f(x) = \frac{1}{x-2}$ b. $f(x) = \frac{x^2-x-12}{x+3}$ c. $f(x) = -x^3 + 4x$

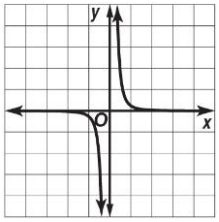
6. Describe the end behavior of $f(x) = -8x^3 + 4x^2 - 7x + 1$

7. The function $f(x) = x^3 - 6x^2 + 9x + 1$ represents the height in feet of an air particle, where x is time in seconds. What is the relative maximum height reached by the particle?

8. Determine the intervals where the function $f(x) = -2x^3 - 4x^2 + x - 1$ is increasing and/or decreasing.

Chapter 2 & 3 (Unit B)

1. The graph of $f(x) = \frac{1}{4}x^{-3}$ is shown at right.



What is the domain of the function?

A) $(-\infty, \infty)$ C) $(-\infty, 0)$ or $(0, \infty)$

B) $(0, \infty)$ D) $(-\infty, 0]$ or $[0, \infty)$

2. Determine the horizontal and vertical asymptotes for the graph of $f(x) = \frac{x^2 - 4}{x^3 - 5x^2 + 6x}$.

3. Create a rational function that:

a) has no horizontal asymptotes b) has a horizontal asymptote at $y = 2$

4. Analyze the graph of $f(x) = \frac{1}{4}e^x$. Find the domain, range, asymptote equations, where the function is increasing & decreasing, and end behavior.

5. Solve $\log_4 x + \log_4(x + 2) = \log_4 35$.

6. Solve $4^{x-3} = 7$

7. Solve $\log (x - 21) + \log x = 2$

8. There are initially 500 deer in a population in 2015. The deer are growing at a rate of 10.7% each year. Determine the year in which the population will double.

9. Expand: $\ln a^4 b^3 \sqrt[4]{c}$

10. Condense: $\log(x + 2) - \frac{1}{4}\log(y - 4)$