Calculus 30- Typical Exam Questions

A. Determine the domain and the range of the following:

1. $y = -x^2 + 4$

    D: _____

    R: _____

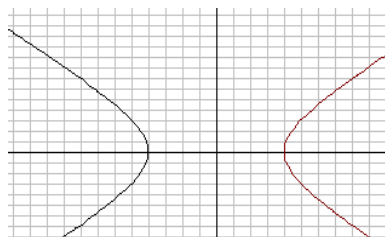2. $y = \sqrt{16 - x^2}$

    D: _____

    R: _____

3. $y = \dfrac{1}{(x+6)(x-1)}$

4.

    D: _____

    R: _____

    D: _____

    R: _____

B. Given the domain and range, determine the equation of the following:
1. domain: $(-\infty, -4] \cup [4, \infty)$, range $[0, \infty)$ _____
2. domain: $[-6, 6]$, range $[0, 6]$ _____
3. domain: $(-\infty, -4) \cup (-4, 5) \cup (35, \infty)$, range $(-\infty, 0) \cup (0, \infty)$ _____

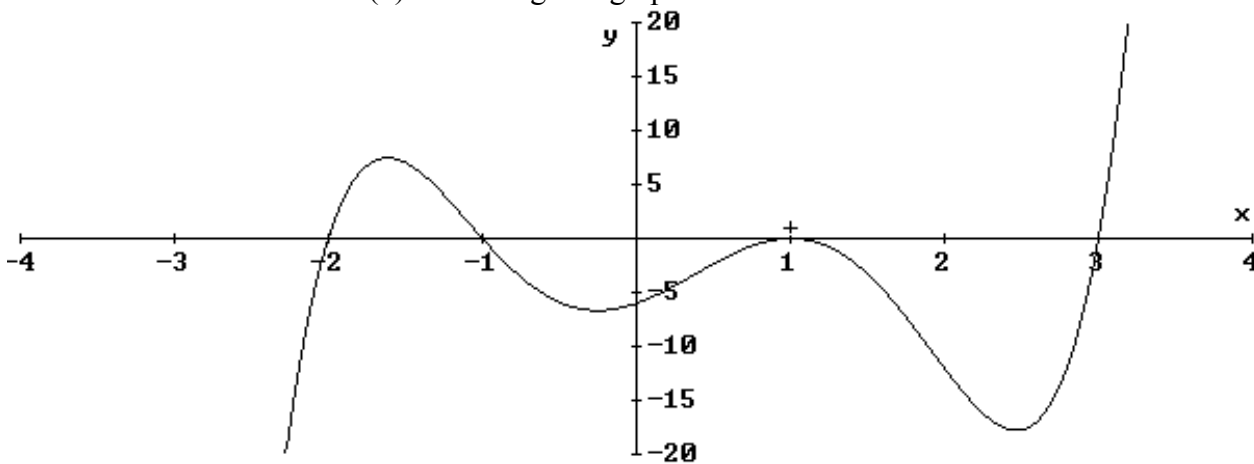C. Given: $f(x) = -5x - 2$ and $g(x) = -2x^2 + 1$, determine:
    1. f(x) + f(x)   2. f(x) * g(x)   3. $(g \circ f)x$ 4. $(f \circ g)x$
D. Determine the value of f(x) from the given graph:

f(-2.2) = _____   f(2.5) = _____   f(1.25) = _____   f (_____) = 15

1. $\displaystyle \lim_{x \to 4} x^3 - 5x + 2$

2. $\displaystyle \lim_{x \to -2} \frac{6x^2 - 5}{x - 2}$

3. $\displaystyle \lim_{x \to 3} \frac{x^2 - 5x + 6}{x - 3}$

4. $\displaystyle \lim_{x \to 0} \frac{\sqrt{x + 4} - 2}{x}$

5. $\displaystyle \lim_{x \to 0} \frac{\sin 4x}{5x}$

6. $\displaystyle \lim_{x \to 0} \frac{\sin x - \sin x \cos x}{x^2}$

7. $\displaystyle \lim_{x \to 25} \frac{x - 25}{\sqrt{x} - 5}$

8. $\displaystyle \lim_{x \to \infty} \frac{5x^3 - x}{x^2 + 3}$

9. $\displaystyle \lim_{x \to \infty} \frac{7x^3 - 5x^2 + 6}{4x^3 + 2x - 7}$

10. $\displaystyle \lim_{x \to \infty} \frac{3x^2 - 5x - 2}{4x^5 + 3x - 9}$

11. $\displaystyle \lim_{x \to 2} \frac{x^3 - 8}{x - 2}$

12, $\displaystyle \lim_{x \to 4^+} \frac{5}{4 - x}$

13. $\displaystyle \lim_{x \to 2^-} \frac{1}{x^2 - 5x + 6}$

14. $\displaystyle \lim_{x \to -\infty} x^3 + 2x^2$

15. Determine the equation of the tangent line to the curve $f(x) = x^4 + x + 1$ at x = -2. (do not use derivatives)