

PRACTICE MIDTERM I

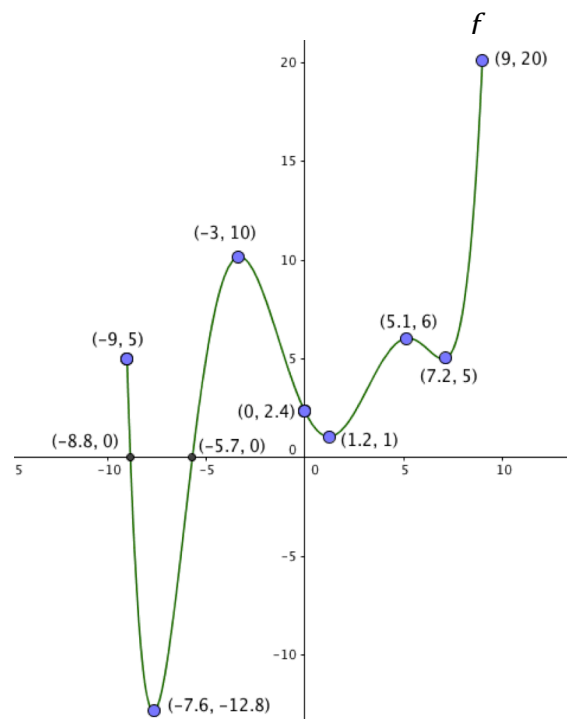
I. Circle the correct answer.

- Which of the following solution sets represents a function?
 - $\{(1,0)(0,1)(2,2)(4,-4)(0,5)\}$
 - $\{(1,1)(-3,4)(-1,4)(3,4)(1,0)\}$
 - $\{(-1,-1)(-2,0)(0,2)(1,3)(-1,1)\}$
 - $\{(0,0)(1,3)(3,1)(2,1)(1,4)\}$
- What is the domain of $f(x) = \frac{2x}{x-5}$?
 - $x > 0$
 - $x > 5$
 - $x \neq 5$
 - $x \neq 0$
- What is the domain of $f(x) = \sqrt{x+5}$?
 - $x \neq 0$
 - $x \geq -5$
 - $x \neq -5$
 - $x > -5$
- What is the range of $f(x) = 3x^2$?
 - $(3, \infty)$
 - $(0, \infty)$
 - $[0, -\infty)$
 - $[0, \infty)$
- If $f(x) = -3x^2 + x$ and $g(x) = 5x - 2$, then $(f - g)(x) =$ _____.
 - $-3x^2 - 4x + 2$
 - $-3x^2 - 4x - 2$
 - $-3x^2 - 6x + 2$
 - $-3x^2 + 6x - 2$
- If $f(x) = 4x - 1$ and $g(x) = x^2 - 1$, then $(f \bullet g)(x) =$ _____.
 - $x^2 + 4x - 2$
 - $4x^3 + x^2 - 4x + 1$
 - $x^3 + x^2 - 4x - 1$
 - $4x^3 - x^2 - 4x + 1$

7. The *difference quotient* is given by $\frac{f(x+h)-f(x)}{h}$, $h \neq 0$. What is the *difference quotient* of $f(x) = 3x + 1$?
- h
 - $3h$
 - 3
 - 0

II. Use the graph of f to answer questions 8 – 19.

- $f(0) = \underline{\hspace{2cm}}$.
- $f(-3) = \underline{\hspace{2cm}}$.
- The y - intercept is $\underline{\hspace{2cm}}$.
- List the x -intercept(s) $\underline{\hspace{2cm}}$.
- List at least one value of x for $f(x) = 6$? $\underline{\hspace{2cm}}$.
- What is the domain and range for the graph?
 - D: $(-\infty, \infty)$, R: $(-\infty, \infty)$
 - D: $[-7.6, 20]$, R: $[-9, 9]$
 - D: $[-10, 10]$, R: $[-15, 20]$
 - D: $[-9, 9]$, R: $[-7.6, 20]$



- List the interval(s) where f is increasing
 $\underline{\hspace{4cm}}$.
- List the interval(s) where f is decreasing
 $\underline{\hspace{4cm}}$.
- There is a local max at...
 - $x = 0$
 - $x = 7.2$
 - $x = 5.1$
 - Both b & c
- There is a local min at...
 - $x = -3$
 - $x = -7.6$
 - $x = 7.2$
 - Both b & c
- The graph of f has no absolute max. True / False (circle one).
- At $x = -7.6$, f has a local minima and an absolute minimum. True/False (circle one)

III. Read the questions. Then, answer the questions accordingly.

20. Given $h(x) = 2x^3 - 5x + 1$, which of the following points are on the graph?

- a. $(-1, 4)$
- b. $(-1, -6)$
- c. $(3, 39)$
- d. $(2, 6)$

21. $G(x) = 2x^4 - 2x$ is what type of function?

- a. odd
- b. even
- c. neither

22. $F(x) = \frac{2x^3}{|x|}$ is what type of function?

- a. odd
- b. even
- c. neither

23. Find the average rate of change of $f(x) = 3x - 4x^2$ from 2 to 3. Then find the equation of the secant line.

24. If $f(x) = \begin{cases} -\frac{1}{2}x & \text{if } x < 0 \\ 5 & \text{if } x = 0 \\ x^3 & \text{if } x > 0 \end{cases}$, then $f(2) = \underline{\hspace{2cm}}$.

25. For the following piecewise function, state the domain and graph the function.

$$f(x) = \begin{cases} \sqrt[3]{x} & \text{if } x < 0 \\ -4 & \text{if } x = 0 \\ x + 1 & \text{if } x > 0 \end{cases}$$