Math 141 Name: _____

QUIZ 1B

(CHAPTER 1: FUNCTIONS)
MATH 141 – SPRING 2026 – KUNIYUKI
60 POINTS TOTAL

No notes or books allowed. A scientific calculator is allowed.

You may assume that two-dimensional graphs are in the usual Cartesian *xy*-plane. Give exact answers, unless you are told to approximate.

SHORTER PROBLEMS (21 POINTS)

1) (5 points). Write the domain of f, where $f(x) = \dfrac{\sqrt[4]{x+2}}{x-3}$, using interval form (the form with parentheses and/or brackets).

2) (1 point). Evaluate $[\![-2.3]\!]$. (This is the same as $\lfloor -2.3 \rfloor$.)

3) (2 points). Find functions g and f such that $(f \circ g)(x) = (3x-5)^4$.
You may not use the identity function. Fill in the blanks:

$g(x) =$_____ $f(u) =$_____

4) (1 point). The graph of $y = \frac{1}{x^4} - x^6$ is symmetric about … (Box in one:)

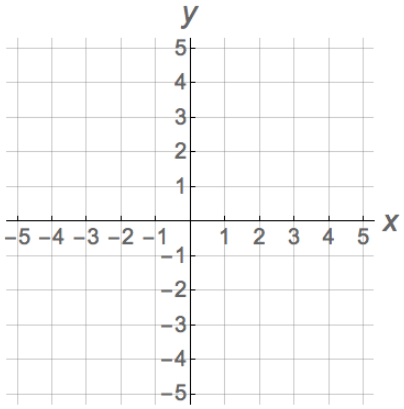
the x-axis the y-axis the origin (none of these)

5) (1 point). The graph of $y = x^7 + 1$ is symmetric about … (Box in one:)

the x-axis the y-axis the origin (none of these)

6) (2 points). If the point $(-1, 4)$ lies on the graph of $y = f(x)$, where f is a one-to-one function, what point must then lie on the graph of $y = f^{-1}(x)$?

7) (2 points). Graph $x = y^2 + 1$ on the grid below.



8) (1 point). Let $f(x) = \sqrt[3]{x+4}$. What is $f^{-1}(x)$?

9) (6 points). Match the equations with their corresponding graphs by writing the appropriate letters in the blanks. The *x*- and *y*-axes are not necessarily scaled the same way.

The graph of $y = \sqrt[3]{x}$ is Graph _____.

The graph of $y = x^{2/3}$ is Graph _____.

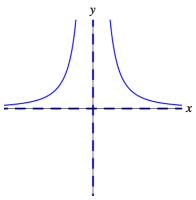
The graph of $y = \dfrac{1}{x}$ is Graph _____.

The graph of $y = \dfrac{1}{x^2}$ is Graph _____.

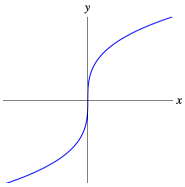
The graph of $y = |x|$ is Graph _____.

The graph of $y = \sqrt{49 - x^2}$ is Graph _____.

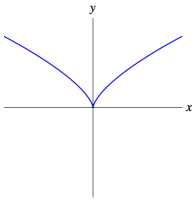
Graph A



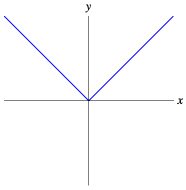
Graph B



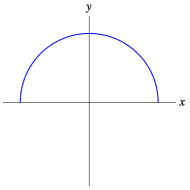
Graph C



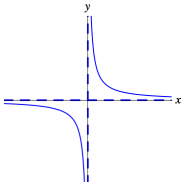
Graph D



Graph E



Graph F

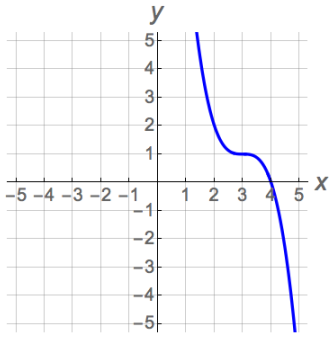


LONGER PROBLEMS (39 POINTS)

Show all work, simplify as appropriate, and use "good form and procedure" (as in class). Box in your final answers!

10) Find **and box in** the x-intercept[s] (if any) of the graph of $y = \sqrt{\dfrac{3x^2 - 8x + 2}{x - 5}}$ in the usual xy-plane. Hint: Factoring over $\mathbb{Z}$, the set of integers, won't work here. Think about another formula you could use. (7 points)

11) The graph below is obtained by taking a basic graph from Section 1.3 and applying rigid transformations. Find an equation for the graph. (5 points)



Fill in the blank: $y =$ _____.

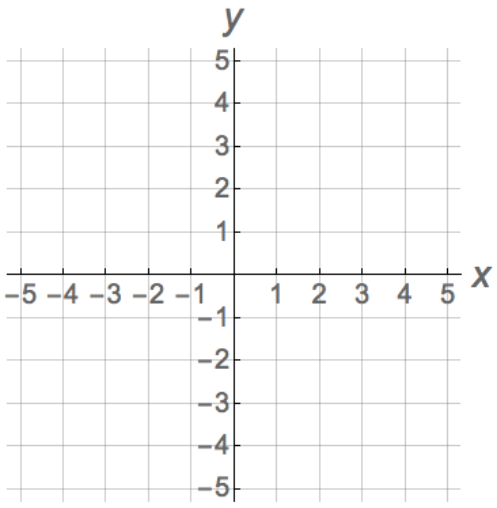
12) f is the function defined piecewise by: $f(x) = \begin{cases} x^2 + 1, & -2 \le x \le 1 \\ \sqrt{x-1}, & 1 < x < 5 \end{cases}$. (11 pts.)

a) Evaluate $f(-2)$. (1 point)

b) Evaluate $f(2)$. (1 point)

c) Evaluate $f(6)$. (1 point)

d) Graph $y = f(x)$ on the grid below. Be accurate. Clearly indicate whether endpoints are included or excluded, as in class. (6 points)



e) Give the **domain** of the function f using interval form (the form with parentheses and/or brackets). (1 point)

f) Give the **range** of the function f using interval form (the form with parentheses and/or brackets). (1 point)

13) Let $f(x) = 4x^3 - x$. Find the average rate of change of f from $x = 2$ to $x = 6$. Assume that x is length measured in inches and $f(x)$ is cost measured in dollars. Write the appropriate unit in your final answer. Show all work, as in class! (7 points)

14) Let $f\left(x\right)=\frac{3}{x}$. Simplify the difference quotient completely: (9 points)

$$\frac{f\left(x+h\right)-f\left(x\right)}{h}$$

Show all work!