

Exam 1

Student Name: _____

Student ID#: _____

Each problem is worth 5 points. Give a complete solution to receive the full credit!

1. Replace the question mark by $<$, $>$, or $=$, whichever is correct.

(a) $\frac{1}{3} ? 0.33333333$

(b) $\frac{2}{3} ? 0.666666667$

(c) $\sqrt{2} ? 1.4142136$

(d) $e ? 2.71828182$

(e) $\pi ? 3.14$

2. Consider the table giving values for height and weight of 5 individuals. Determine which

Height	61	73	63	66	64
Weight	146	174	123	126	138

of the following best describes the relationship between height and weight.

(a) Height is a function of weight.

(b) Weight is a function of height.

(c) Height is a function of weight and weight is a function of height.

(d) None of the above.

3. The function f is defined by

$$f(x) = \begin{cases} 3x - 1, & -3 \leq x < 0 \\ x^2 + 5, & 0 \leq x < 2 \\ -x, & 2 \leq x \leq 4 \end{cases}$$

find $(f \cdot (f \circ f))(2)$.

4. Find the quotient and the remainder of $1 - \frac{1}{3}x + \frac{1}{2}x^4$ divided by $\frac{2}{3}x^2 - x + 1$.

5. Perform the indicated operation and simplify the result.

$$\frac{x^2 + 1}{x^3 + 27} - \frac{x + 1}{x^2 - 9}$$

6. Simplify expression:

$$\sqrt[7]{\frac{(yz)^{-5}}{z\sqrt[3]{yz}}}.$$

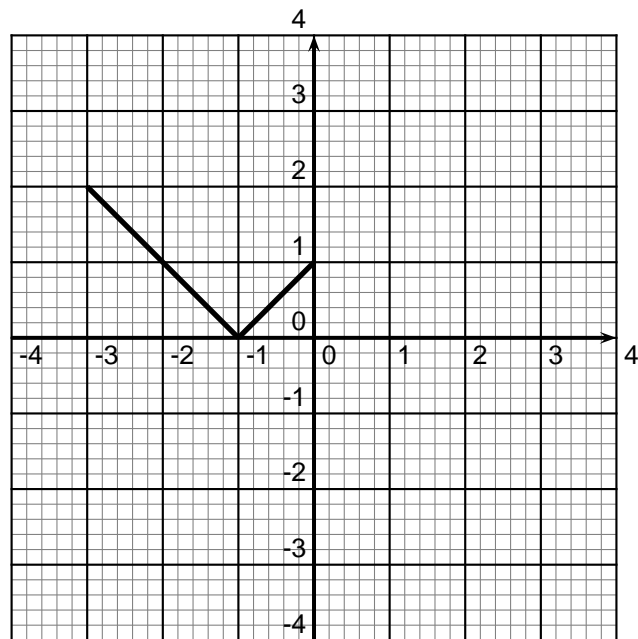
Express the answer so that all exponents are positive.

7. Find the domain over the field of real number of the function:

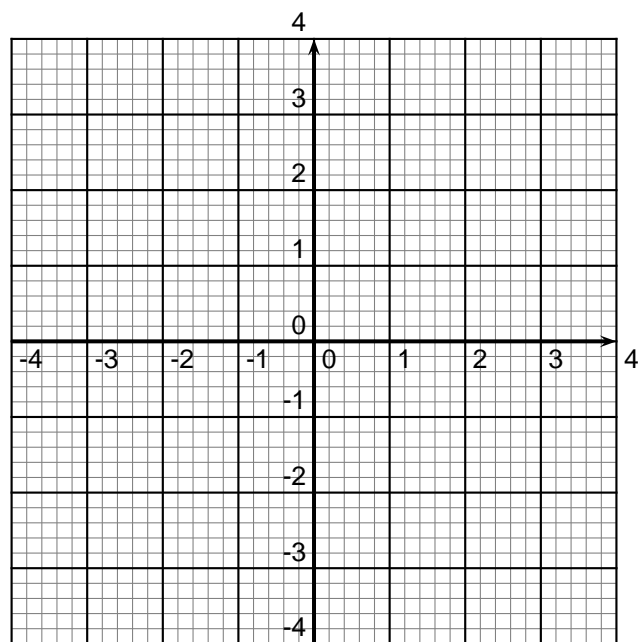
$$f(z) = \frac{\sqrt{1-z}}{z+9}.$$

8. Show that the function $f(x) = 1 + \frac{3}{x}$ is one-to-one function and then find its inverse.

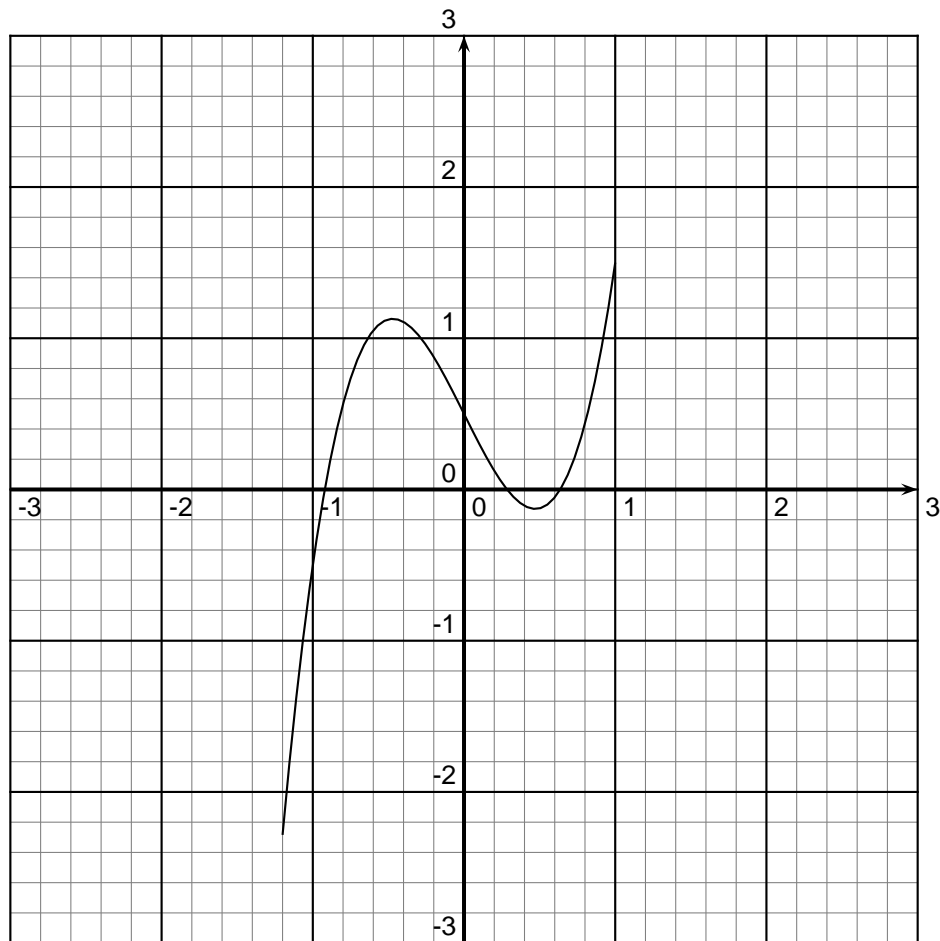
9. The graph of the function $f(x)$ is given.



Plot the graph of the function $g(x) = 3f(x - 2) + 1$ using the grid provided below.



10. The graph of the function $g(x)$ is given.



- State approximately the range of the function.
- State approximately the interval(s) on which $g(x)$ is increasing.