

## Math1090 Practice Final Exam

1. Find the inverse,  $f^{-1}(x)$  for each given function and state the domain of the both the function and its inverse.

(a)  $f(x) = \ln(x-1)$

$$f^{-1}(x) = \underline{\hspace{10cm}}$$

Domain of  $f^{-1}(x)$  :  $\underline{\hspace{10cm}}$

Domain of  $f(x)$  :  $\underline{\hspace{10cm}}$

(b)  $f(x) = \frac{x^5}{x^5-1}$

$$f^{-1}(x) = \underline{\hspace{10cm}}$$

Domain of  $f^{-1}(x)$  :  $\underline{\hspace{10cm}}$

Domain of  $f(x)$  :  $\underline{\hspace{10cm}}$

2. Find the function which relates Celsius to Fahrenheit using the fact that 32 degrees Fahrenheit corresponds with 0 degrees Celsius, and 212 degrees Fahrenheit corresponds to 100 degrees Celsius.

3. For an investment that earns 6% interest compounded monthly, how much should be deposited at the beginning of each month in order to have \$250,000 after 20 years?

Monthly deposit: \_\_\_\_\_

4. Showing all your steps clearly, solve this system of linear equations.

$$2x - 4y + 2z = -4$$

$$4x - 9y + 7z = 2$$

$$-2x + 4y - 3z = 10$$

Solution: \_\_\_\_\_

5. Find the vertex, axis of symmetry and zeros of the parabola

$$y=-(x-3)^2+6$$

Vertex: \_\_\_\_\_

Axis of symmetry: \_\_\_\_\_

Zeros: \_\_\_\_\_

6. Let  $f(x)=3x^2+1$  ,  $g(x)=x+6$  , and  $h(x)=\frac{x}{x^3-10}$  . Find the following.

(a)  $(fg)(x)$

$$(fg)(x) = \underline{\hspace{10cm}}$$

(b)  $(g \circ h)(x)$

(c)  $(f \circ g)(1)$

$$(g \circ h)(x) = \underline{\hspace{10cm}}$$

(d)  $(f+g)(x)$

$$(f \circ g)(1) = \underline{\hspace{10cm}}$$

$$(f+g)(x) = \underline{\hspace{10cm}}$$

7. You are buying your first home. You have found a home that costs \$190,000. You have been able to secure a 30-year loan from a bank at an interest rate of 5.35% compounded monthly.

(a) What will your monthly payment be?

(b) How much will you pay in interest over the life of the loan? Monthly payment: \_\_\_\_\_

Total interest paid: \_\_\_\_\_

8. Graph the solution set of the following system of inequalities and find and label all vertices of the boundary.

$$3x + 4y \geq 12$$

$$x - y \geq 2$$

$$x \leq 6$$

$$y \geq 0$$

