

Name _____ Group _____

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Functions: Properties, Parameters, Inverse, Operations, and Composites

Each question is worth 2 points

1) Given:

$$f(x) = x^2 + 4$$

$$g(x) = 3x - 1$$

$$h(x) = f(g(x))$$

Determine the rule for $h(x)$.

$$h(x) = 9x^2 - 6x + 5$$

2) Given:

$$f(x) = 6x + 2$$

$$g(x) = 4 + 2x$$

$$h(x) = g^{-1}(f(x))$$

Find $h(-3)$.

$$h(-3) = -10$$

3) Given $f(x) = 4x^2$, what is the rule of its inverse, f^{-1} and its domain?

$$f^{-1}(x) = \sqrt{\frac{x}{4}} \quad \text{domain: } [0, +\infty[$$

4) Given:

$$f(x) = 4x + 16$$

$$g(x) = 12x - 8$$

$$h(x) = g(f(x))$$

Determine the zero of $h(x)$.

$$\text{zero is located at } x = -3.8333$$

5) Given $f(x) = \frac{3x+2}{4x-8}$, what is the rule of its inverse, f^{-1} .

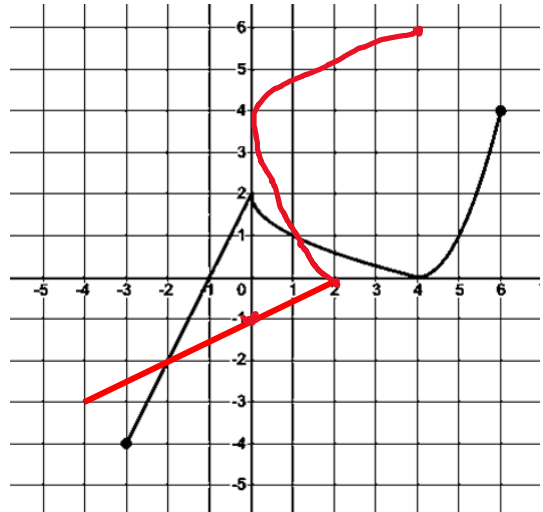
$$f^{-1}(x) = \frac{8x + 2}{4x - 3}$$

6) Given the function, f , graphed to the right:

- Sketch its inverse, f^{-1}
- Determine the extrema of f^{-1}

minimum: $y = -3$

maximum: $y = 6$



7) Given:

$$f(x) = 2x^2 + 4$$

$$g(x) = 3x - 8$$

$$h(x) = f + g$$

Determine the initial value of $h(x)$.

initial value = -4

8) Given:

$$f(x) = 2x + 4$$

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

$$h(x) = 3x - 2$$

$$i(x) = \frac{f - g}{h}$$

Determine the rule for $i(x)$.

$$i(x) = \frac{-3x^2 - 4x + 6}{3x - 2}$$

9) Given:

$$f(x) = \frac{\sqrt{x-1}}{x}$$

$$g(x) = x^2 + 1$$

$$h(x) = f(g(x))$$

Determine $h(5)$.

$$h(5) = \frac{\sqrt{25}}{26} = \frac{5}{26} = 0.1923$$

10) Find two functions, f and g , such that $g(f(0)) = 4$.

There are many possible functions. One option is:

$$f(x) = x^2 + 6$$

$$g(x) = x - 2$$