Name:
Group 1
Result:

1. *(4 points)*

Consider functions $f(x) = 4 - x^2$ and $g(x) = x + 1$.

(a) Calculate:

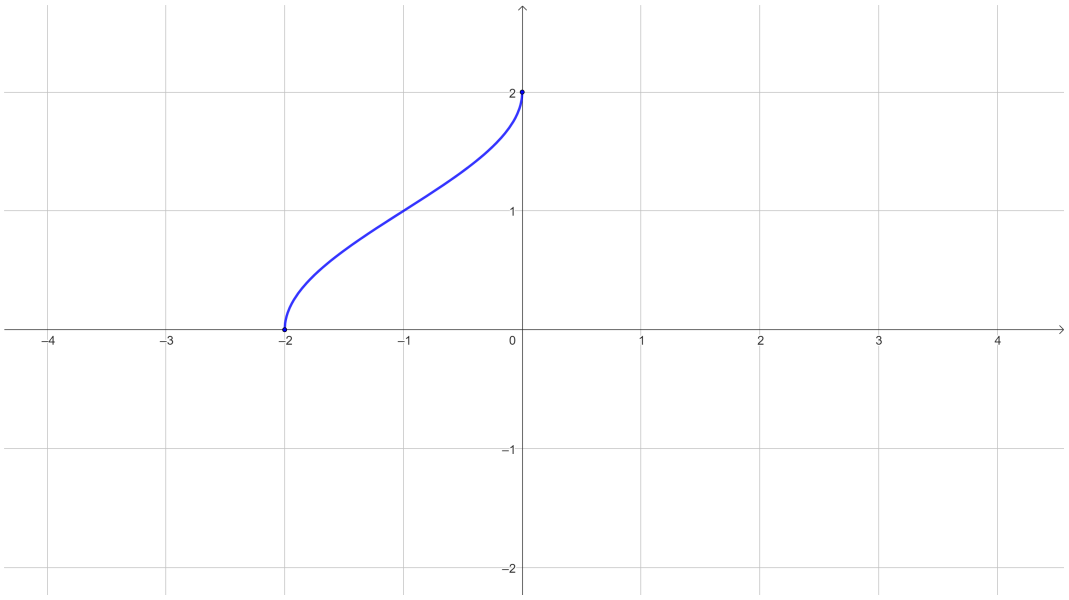
i) $(f \circ g)(2)$

ii) $(g \circ f)(2)$

(b) Find the domain and range of the function $h(x) = \sqrt{(f \circ g)(x)}$.

2. *(3 points)*

The diagram below shows the graph of $y = f(x)$.



(a) State the domain and range of $f(x)$.

(b) Explain why f has an inverse.

(c) On the diagram above sketch the graph of $y = f^{-1}(x)$.

3. *(3 points)*

Consider the function $f(x) = x^2 - 4x + 3$. The domain of f is restricted to $x \geq k$, where k is the smallest possible real number so that f has an inverse function.

(a) Find the value of k.

(b) Find $f^{-1}(x)$.

4. *(6 points)*

Consider the function $f(x) = \dfrac{3x-6}{x+2}$.

(a) Sketch the graph of $y = f(x)$.

(b) Solve the inequality:

$$f(x) \geq -\frac{1}{3}x + 4$$

(c) Find $f^{-1}(x)$.