

Interactive Problem Solving

In this problem set you will solve problems interactively, meaning that you will confirm your solutions to the questions **Desmos** and **Python**. Explanation of **Python** will be done in class,

Question 1. Let $f(x) = -2x^2 + 5x + 3$, and $g(x) = -2\sqrt{8x + 1} + 4$.

- (a) Compute $f(-1)$. (Confirm with **Python**)
- (b) Compute $g(3)$. (Confirm with **Python**)
- (c) Compute $f(f(3))$. (Confirm with **Python**)
- (d) Compute $f(g(f(0)))$. (Confirm with **Python**)
- (e) State the Domain and Range of f . (Confirm with **Desmos**)
- (f) State the Domain and Range of g . (Confirm with **Desmos**)
- (g) Factor f .
 - To confirm this, use **desmos** and plot both the original f and f in factored form.
 - If the graphs **overlap** then your answer is correct.
- (h) State the x-intercepts of f . (Confirm with **Desmos**).
- (i) Convert f to vertex form. (Confirm your answer in **Desmos** using the overlapping strategy).

Question 2. Let $f(x) = 3x^2 - 5x - 12$ and $g(x) = x - 3$. In this question we will try to find the intersection point of the two graphs.

- (a) Factor f (Just for practice).
- (b) Let $h(x) = f(x) - g(x)$, state the Domain and Range of $h(x)$.
- (c) Factor $h(x)$.
- (d) Determine the x-intercepts of $h(x)$, label them x_1 and x_2 .
- (e) Calculate $g(x_1)$ and $g(x_2)$, afterwards write down the points $(x_1, g(x_1))$ and $(x_2, g(x_2))$.
- (f) Graph both $f(x)$ and $g(x)$ in Desmos, hover over the intersection points and confirm that they **both** match what you got.