

MATH 142A HOMEWORK 9

WINTER 2021

Due: Sunday, March 14, 11:59 PM (via Gradescope)

All exercises below are from *Ross*:

- 1) Exercise 30.2 – 2 points
- 2) Exercise 30.4 – 2 points
- 3) Exercise 30.5 – 2 points
- 4) Exercise 31.2 – 2 points
- 5) Exercise 31.4 – 2 points
- 6) Exercise 31.5 – 2 points
- 7) Problem 7 – 2 points

Let $f = o(g)$ as $x \rightarrow x_0$. Prove that $f = O(g)$ as $x \rightarrow x_0$.

- 8) Problem 8 – 2 points

Show that $o(O(h)) = o(h)$ as $x \rightarrow x_0$. (Hint. Let $f = o(g)$ as $x \rightarrow x_0$ and $g = O(h)$ and $x \rightarrow x_0$. Show that $f = o(h)$).

- 9) Problem 9 – 2 points

Let $f_i = o(g)$ as $x \rightarrow x_0$ for $i \in \{1, 2\}$. Show that $(f_1 + f_2) = o(g)$ as $x \rightarrow x_0$.