(1) Warm-ups:
   (a) With your group members, discuss linearization and Newton’s method.
   (b) With your group members, discuss how you would tell a computer to perform Newton’s method; if you have basic knowledge of programming, this could be helpful, but really all I’m looking for you to discuss is how to break Newton’s method down into simple repeatable chunks a computer could follow.

(2) Find the linearization of the function $\sqrt[3]{x^2 + 2}$ at $x = 5$. For what range of $x$ is the linearization accurate to within 0.1? (hint: find $x$ satisfying $|\sqrt[3]{x^2 + 2} - L(x)| < 0.1$)

(3) Use Newton’s method to approximate $\frac{100}{\sqrt{100}}$, accurate up to 8 decimal places.

(4) Use Newton’s method to find all the roots of $x^3 = \arctan(x)$ accurate to 6 decimal places.

(5) Use Newton’s method to find the absolute max of $f(x) = x \cos(x)$ on $[0, \pi]$, accurate up to 6 decimal places.

(6) There are infinitely many lines tangent to the curve $y = -\sin(x)$ that also pass through the origin. There is one such line with the largest slope amongst these tangent lines. Use Newton’s method to find the slope of this line correct up to 6 decimal places.

(7) Show why, using Newton’s method as explained in class yesterday (the process of repeatedly finding the roots of the linearization of the function) that for each $n$, $x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$