In lecture we saw how to find the roots of a cubic polynomial
\[ x^3 + bx^2 + cx + d. \]

- Eliminate the quadratic term: substitute \( x = z - \frac{b}{3} \) to get a “depressed cubic” of the form
  \[ z^3 + pz + q. \]
- Viète’s trick: substitute \( z = v - \frac{p}{3v} \), then multiply through by \( v^3 \) to get a quadratic in \( v^3 \).
- Find \( v^3 \) either by factoring the quadratic or by using the quadratic formula, then take cube roots to get \( v \).
  (This is why we spent so much time taking cube roots earlier.)
- Substitute back to get \( z \) and then \( x \).

Get started on §2.4 #6, which will be on the next homework.

6. Solve the following cubic equations:

   (a) \( z^3 - 9z - 28 = 0 \). (Answer: 4, \(-2 \pm \sqrt{3}i\).)
   (b) \( x^3 - 9x^2 + 9x - 8 = 0 \). (Answer: 8, \( \frac{1 \pm \sqrt{3}i}{2} \).)
   (c) \( z^3 - 3z - 1 = 0 \). (Answer: \( 2 \cos 20^\circ, 2 \cos 140^\circ, 2 \cos 260^\circ \).)