7. (a) Prove that there is no rational x for which $x^3 = 4$. [5]

   (b) Which part of the argument does not work if we try to follow the same outline to prove that there is no rational z for which $z^3 = 8$? [2]

   (c) Prove that there is no rational y for which $2^y = 27$. [4]

   (d) Where x and y are as defined in parts (a) and (c), determine whether the following quantities are rational or irrational: [6]

   i. $x + \frac{22}{7}$

   ii. $\frac{2}{27}y$

   iii. x^y