

Question 1:

Answer 1: From the definition, we can know the related condition number is

$$\kappa(a/b) = \lim_{\epsilon \rightarrow 0} \max \frac{|(a/b)^* ((\epsilon a/a) - (\epsilon b/b))|}{|\epsilon(a/b)|}$$

If 'a' is a constant, define $f(b) = a/b$, then we have

$$\kappa(a/b) = \max \frac{|(a/b)^* (-\epsilon b/b)|}{|-a(\epsilon b)/b^2|} = 1$$

So when 'b' is constant, the relative condition number of the division operation is 1.

Question 2:

Answer 2:

ill-conditioned: (a), (d)

well-conditioned: (b), (c)