1. Expression for i_b, i_c and V_{out} for the given circuit are

$$i_b = \frac{V_{cc}}{R_B + r_b + (\beta+1)r_e}$$

$$i_c = \frac{\beta V_{cc}}{R_B + r_b + (\beta+1)r_e}$$

$$V_{out} = V_{cc} - \frac{\beta V_{cc} R_C}{R_B + r_b + (\beta+1)r_e}$$

2. Expression for i_b, i_c and V_{out} for the given circuit are

$$i_b = \frac{V_{cc}}{R_B + r_b + (\beta+1)(r_e + R_e)}$$

$$i_c = \frac{\beta V_{cc}}{R_B + r_b + (\beta+1)(r_e + R_e)}$$

$$V_{out} = V_{cc} - \frac{\beta V_{cc} R_C}{R_B + r_b + (\beta+1)(r_e + R_e)}$$

3. Expression for v_{out} considering $r_g \to \infty$

$$v_{out} = -(g_m - \frac{1}{R_G}) v_{in} (r_0 || R_D || R_G)$$

4. Expression for v_{out} considering $r_g \to \infty$

$$v_{out} = -g_m v_{in} (r_0 || R_D)$$

5. (a) Expression for V_{out} without assuming the op-amp is ideal

$$V_{out} = \frac{A V_{s1}}{R_0[\frac{1}{R_0} + \frac{1}{R_l} + \frac{1}{R_2} - \frac{R_1}{(R_1+R_2)R_2}]}$$

   (b) Expression for V_{out} assuming the op-amp is ideal

$$V_{out} = \frac{R_2}{R_1}((R_1 + R_2) I_{s2} - V_{s1})$$

6. (a) V_{out}/V_x without assuming the Op-Amp to be ideal

$$\frac{V_{out}}{V_x} = \frac{(2A-1)R}{R_0 + (1+A)R}$$

   (b) V_{out}/V_x assuming the Op-Amp to be ideal

$$\frac{V_{out}}{V_x} = 2$$

7. (a) Expression for voltage V_l in circuit 1

$$V_l = \frac{A_i V_s R_0 R_l}{A_i A_v R_0 R_l - (R_0 + R_l)(R_i + R_s)}$$

   (b) Expression for voltage V_l in circuit 2

$$V_l = \frac{-A_1 V_s R_0 R_l}{A_1 A_2 R_i R_0 + (R_0 + R_l)(R_i + R_s)}$$