Answers to Exercise 2.1
Counting Subatomic Particles

1.

symbol	^{96}Ru	$^{135}Ba^{2+}$	$^{37}Cl^{-}$	$^{65}Cu^{2+}$	^{66}Zn
# protons	44	56	17	29	30
# neutrons	52	79	20	36	36
# electrons	44	54	18	27	30
overall charge	0	+2	-1	+2	0

2.

(a) ^{79}Br
^{77}Se has 34 protons and 43 neutrons
^{79}Br has 35 protons and 44 neutrons

(b) ^{40}Ar
^{40}Ca has 20 protons and 20 neutrons
^{40}Ar has 18 protons and 22 neutrons

(c) neither
^{31}P has 15 protons and 16 neutrons
^{32}S has 16 protons and 16 neutrons

3. 197

Look up the average atomic mass of gold on the periodic table. It is 196.97 u.

If there is only one isotope of gold, it must be ^{197}Au (since 196.97 rounds to 197 and it is impossible for a mass number to be anything other than a whole number).

4.

(a) **^{187}Re**

Its atomic mass is closer to the average atomic mass of Re (186.207 u).

(b) How many protons, neutrons and electrons does a neutral atom of ^{187}Re contain?

__**75**_ protons __**112**__ neutrons __**75**_ electrons