Isotopes

1	Symbol	Mass Number	Atomic Number	# of Protons	# of Neutrons	# of Electrons
a	$^{23}_{11}Na$					
b	$^{20}_{10}Ne$					
c	$^{201}_{80}Hg$					
d	$^{65}_{30}Zn$					
e	$^{27}_{13}Al$					
f		84	36			36
g				35	45	35
h		127	53			54
I			27		32	27
j	Zn				36	
k	Cd^{2+}	112				
l				38	50	36
m	X^{2-}				75	54
n	X^{3+}	103				42
o	X^{3-}		33		42	

2. The following mixtures of isotopes are found in nature. Calculate the expected atomic mass of a sample of each mixture.
   a) ^{10}B = 18.8%, ^{11}B = 81.2%
   b) ^{69}Ga = 60.0%, ^{71}Ga = 40.0%
   c) ^{70}Ge = 20.5%, ^{72}Ge = 27.4%, ^{73}Ge = 7.8%, ^{74}Ge = 36.5%, ^{76}Ge = 7.8%
   d) ^{64}Zn = 48.9%, ^{66}Zn = 27.8%, ^{67}Zn = 4.1%, ^{68}Zn = 18.6%, ^{70}Zn = 0.6%
   e) ^{90}Zr = 51.5%, ^{91}Zr = 11.2%, ^{92}Zr = 17.1%, ^{94}Zr = 17.4%, ^{96}Zr = 2.8%
   f) ^{92}Mo = 15.8%, ^{94}Mo = 9.0%, ^{95}Mo = 15.7%, ^{96}Mo = 16.5%, ^{97}Mo = 9.5%, ^{98}Mo = 23.8%, ^{100}Mo = 9.6%

3. Calculate the percentage of each isotope present in the following mixtures.
   a) A mixture of ^{6}Li and ^{7}Li has an average mass of 6.94 u.
   b) A mixture of ^{79}Br and ^{81}Br has an average mass of 79.9 u.
   c) A mixture of ^{20}Ne, which has a mass of 19.992 u, and ^{22}Ne, which has a mass of 21.991 u, has an average mass of 20.179 u.
   d) A mixture of ^{107}Ag, with an atomic mass of 106.9041 u, and ^{109}Ag, with an atomic mass of 108.9047 u, that has an average mass of 107.9 u.
   e) A mixture of ^{113}In and ^{115}In has an average mass of 114.8 u.
   *f) Naturally occurring silicon consists of three isotopes, ^{28}Si, ^{29}Si, and ^{30}Si, whose atomic masses are 27.9769, 28.9865, and 29.9838, respectively. The most abundant isotope is ^{28}Si, which accounts for 92.23% of naturally occurring silicon. Given that the observed atomic mass of silicon is 28.0855, calculate the percentages of ^{29}Si and ^{30}Si in nature.
   *g) Naturally, occurring strontium consists of four isotopes, ^{84}Sr, ^{86}Sr, ^{87}Sr, and ^{88}Sr, whose atomic masses are 83.9134, 85.9094, 86.9089 and 87.9056 amu, respectively. The most abundant isotope is ^{88}Sr, which accounts for 82.6 percent of naturally occurring strontium, and the least abundant isotope is ^{84}Sr, which accounts for 0.5 percent of naturally occurring strontium. Given that the observed atomic mass of strontium is 87.62 amu, calculate the percentages of ^{86}Sr and ^{87}Sr in nature.