

Atomic Numbers and Multiplying Fractions

B ⁵	C ⁶	N ⁷	O ⁸	F ⁹	Ne ¹⁰
Al ¹³	Si ¹⁴	P ¹⁵	S ¹⁶	Cl ¹⁷	Ar ¹⁸
Ga ³¹	Ge ³²	As ³³	Se ³⁴	Br ³⁵	Kr ³⁶
In ⁴⁹	Sn ⁵⁰	Sb ⁵¹	Te ⁵²	I ⁵³	Xe ⁵⁴
Tl ⁸¹	Pb ⁸²	Bi ⁸³	Po ⁸⁴	At ⁸⁵	Rn ⁸⁶

The Atomic Number, Z , of an element is the number of protons within the nucleus of the element's atom. This leads to some interesting arithmetic!

A portion of the Periodic Table of the elements is shown to the left with the symbols and atomic numbers for each element indicated in each square.

Problem 1 - Which element has an atomic number that is $5 \frac{1}{3}$ larger than carbon (C)?

Problem 2 - Which element has an atomic number that is $5 \frac{2}{5}$ that of neon (Ne)?

Problem 3 - Which element has an atomic number that is $\frac{8}{9}$ that of krypton (Kr)?

Problem 4 - Which element has an atomic number that is $\frac{2}{5}$ of astatine (At)?

Problem 5 - Which element has an atomic number that is $5 \frac{1}{8}$ that of sulfur (S)?

Problem 6 - Which element has an atomic number that is $3 \frac{2}{3}$ that of fluorine (F)?

Problem 7 - Which element in the table has an atomic number that is both an even multiple of the atomic number of carbon, an even multiple of the element magnesium (Mg) which has an atomic number of 12, and has an atomic number less than iodine (I)?

Answer Key

Problem 1 - Which element has an atomic number that is $5\frac{1}{3}$ larger than Carbon (C)?
Answer: Carbon = 6 so the element is $6 \times 5\frac{1}{3} = 6 \times \frac{16}{3} = \frac{96}{3} = 32$ so **Z=32 and the element symbol is Ge (germanium)**.

Problem 2 - Which element has an atomic number that is $5\frac{2}{5}$ that of Neon (Ne)?
Answer: Neon = 10, so $10 \times 5\frac{2}{5} = 10 \times \frac{27}{5} = \frac{270}{5} = 54$, so **Z=54 and the element is Xe (xenon)**.

Problem 3 - Which element has an atomic number that is $\frac{8}{9}$ that of Krypton (Kr)?
Answer: Krypton=36 so $36 \times \frac{8}{9} = \frac{288}{9} = 32$, so **Z=32 and the element is Ge (germanium)**.

Problem 4 - Which element has an atomic number that is $\frac{2}{5}$ of Astatine (At)? Answer;
Astatine=85 so $85 \times \frac{2}{5} = \frac{170}{5} = 34$, so **Z=34 and the element is Se (selenium)**.

Problem 5 - Which element has an atomic number that is $5\frac{1}{8}$ that of Sulphur (S)?
Answer; Sulphur = 16 so $16 \times 5\frac{1}{8} = 16 \times \frac{41}{8} = 82$, so **Z=82 and the element is lead (Pb)**.

Problem 6 - Which element has an atomic number that is $3\frac{2}{3}$ that of Fluorine (F)?
Answer: Fluorine = 9 so $9 \times 3\frac{2}{3} = 9 \times \frac{11}{3} = \frac{99}{3} = 33$, so **Z=33 and the element is As (arsenic)**.

Problem 7 - Which element in the table has an atomic number that is both an even multiple of the atomic number of carbon, an even multiple of the element magnesium (Mg) which has an atomic number of 12, and has an atomic number less than Iodine (I)?

Answer: The first relationship gives the possibilities: 6, 18, 36, 54. The second clue gives the possibilities 36 and 84. The third clue says Z has to be less than $I = 53$, so **the element must have Z = 36, which is Kr, (krypton)**.