

Name: Key

1. (3 points) How many square inches (in<sup>2</sup>) are there in 0.523 square meters (m<sup>2</sup>)? (1 in = 2.54cm)

$$0.523 \text{ m}^2 \times \left(\frac{10 \text{ cm}}{1 \text{ m}}\right)^2 \times \left(\frac{1 \text{ in}}{2.54 \text{ cm}}\right)^2 =$$

-1/2 for sf error

-1.5 w/ correct sf, but forgetting to square conversion factors  
 Answer: 825 in<sup>2</sup> (3sf)

2. (4 points) Classify the following as a metal, non-metal or metalloid.

- a) sodium Metal                      b) sulfur Non-metal                      1 pt EACH
- c) carbon Non-Metal                      d) cobalt Metal

3. (3 points) Fill in the chart below with the missing information.

-1/2 EACH ERROR

Isotope	Atomic number	Number of neutrons	Mass number
<sup>15</sup> <sub>7</sub> N	7	8	15
<sup>44</sup> <sub>20</sub> Ca	20	24	44

4. (2 points) How many oxygen atoms are there in 3.5g of elemental oxygen? (N<sub>A</sub> = 6.022 × 10<sup>23</sup>)

$$3.5 \text{ g O}_2 \times \frac{1 \text{ mol O}_2}{32.00 \text{ g O}_2} \times \frac{2 \text{ mol O-atoms}}{1 \text{ mol O}_2} \times \frac{6.022 \times 10^{23} \text{ O-atoms}}{1 \text{ mol O-atom}}$$

-1/2 sig fig error                      -1/2 for missing this step  
 Answer: 1.3 × 10<sup>23</sup> O-atoms (2sf)

3. (3 points) How many grams of nickel will have the same number of atoms as 6.01g of iron?

$$6.01 \text{ g Fe} \times \frac{1 \text{ mol}}{55.85 \text{ g Fe}} \times \frac{58.69 \text{ g Ni}}{1 \text{ mol}} =$$

-1/2 for sf error                      (3sf)  
 -1/2 for a wrong element!  
 Answer: 6.32 g Ni