**Quiz 2**

# Directions: Answer each of the following questions. Be sure to use complete sentences where appropriate. For full credit be sure to show all of your work. Where appropriate answers should be boxed for clarity, written to the correct number of significant figures, and, include the proper units.

1. A small hole in the wing of a space shuttle requires a 20.7 cm2 patch. If the patching material costs NASA $3.25/in2 (6 points).
	1. What is the patch’s area in square kilometers, km2?
	2. What is the cost of the patch?
2. The temperature of the lab room is measured to be 21.7 °C (5 points).
3. What is the temperature in Fahrenheit?
4. What is the temperature in Kelvin?
5. Write the isotopic symbols of the form $$ for each isotope (6 points).
	1. the copper isotope with 34 neutrons
	2. the xenon isotope with 77 neutrons
	3. the potassium isotope with 21 neutrons and 18 electrons
6. Are the following statements about subatomic particles true or false (3 points)?
	1. Some atoms do not have any protons. \_\_\_\_\_\_
	2. Protons and neutrons have charges of the same magnitude but opposite sign. \_\_\_\_\_\_
	3. Protons have about the same mass as neutrons. \_\_\_\_\_\_

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# Directions: Answer each of the following questions. Be sure to use complete sentences where appropriate. For full credit be sure to show all of your work. Where appropriate answers should be boxed for clarity, written to the correct number of significant figures, and, include the proper units.

1. A small hole in the wing of a space shuttle requires a 20.7 cm2 patch. If the patching material costs NASA $3.25/in2 (6 points).
	1. What is the patch’s area in square kilometers, km2?

$$20.7 cm^{2}×\left(\frac{0.001 km}{100 cm}\right)^{2}=2.07×10^{-9} km^{2}$$

* 1. What is the cost of the patch?

$$20.7 cm^{2}×\left(\frac{1 in}{2.54 cm}\right)^{2}×\frac{\$3.25}{1 in^{2}}=\$10.42764586=\$10.43$$

1. The temperature of the lab room is measured to be 21.7 °C (5 points).
2. What is the temperature in Fahrenheit?

$$T\_{F}=\left(\frac{9 ℉}{5 ℃}\right)T\_{C}+32 ℉ $$

$$T\_{F}=\left(\frac{9 ℉}{5 ℃}\right)(21.7 ℃)+32 ℉ $$

$$T\_{F}=39.06 ℉+32 ℉=71.06 ℉≈71.1 ℉ $$

1. What is the temperature in Kelvin?

$$T\_{K}=\left(\frac{1 K}{1 ℃}\right)T\_{C}+273.15 K $$

$$T\_{K}=\left(\frac{1 K}{1 ℃}\right)(21.7 ℃)+273.15 K $$

$$T\_{K}=21.7 K+273.15 K=294.85 K≈294.9 K$$

1. Write the isotopic symbols of the form $$ for each isotope (6 points).
	1. the copper isotope with 34 neutrons $$
	2. the xenon isotope with 77 neutrons $$
	3. the potassium isotope with 21 neutrons and 18 electrons $^{+}$
2. Are the following statements about subatomic particles true or false (3 points)?
	1. Some atoms do not have any protons. \_\_false
	2. Protons and neutrons have charges of the same magnitude but opposite sign. \_\_false
	3. Protons have about the same mass as neutrons. \_\_true