## Quiz 00: Solution

Answer each of the following questions using your clicker. If the question is true/false, use the $T$ and $F$ keys to respond. If a numerical answer is required, please express it to the correct number of significant digits, and include the algebraic sign where appropriate. Please do not mark on this quiz paper. Each question is worth 3 points, and there is no partial credit.

1. Which of the following is an example of a base, or fundamental (not derived) unit?
A) N (Newton = force)
C) $\mathbf{k g}$ (kilogram = mass)
E) T (Tesla = magnetic field)
B) J (Joule = energy)
D) A (Ampere = current)
2. The metric unit of time is the
A) metric second. One metric second $=(1 / 86,400)$ english seconds.
B) second. This is the same unit in either the English or metric system.
C) solar second, or the time it takes it the earth to rotate $1^{\circ}$ (out of $360^{\circ}$ ) on its axis.
D) metric century. This is the time it takes a beam of light to travel 100 kilometers.
E) light year. One light year is the distance light travels in the time it takes the earth to complete one orbit.
F) parsec. This is exactly $1 / 12$ the minimum time required to complete the Kessel run in the Millennium Falcon.
3. True or false: If an equation is dimensionally correct, it is also physically correct.
4. True or false: If an equation is physically correct, it is also dimensionally correct.
5. True or false: The following equation is dimensionally correct. The volume of a sphere is:

$$
V=\frac{4}{3} \pi r^{2}
$$

6. Add the following numbers. Express the result with the appropriate number of significant digits.

$$
5.912+7.5=13.4
$$

7. Multiply the following numbers. Express the result with the appropriate number of significant digits.

$$
5.912 \times 7.5=44
$$

8. Convert 50 liters to units of gallons. There are $\mathbf{3 . 7 8 5}$ liters per gallon. Express your final answer with two sig figs.

$$
(501)\left(\frac{1 \mathrm{gal}}{3.7851}\right)=13 \mathrm{gal}
$$

Use the right triangle shown on the right to answer the following questions.
9. Determine the hypotenuse c of this triangle. Express your answer with two sig figs.

$$
c=\sqrt{(10)^{2}+(18)^{2}}=21
$$

10. What is the angle $\theta$ between side $b$ and hypotenuse $c$ ? Answer with two sig figs.

$$
\theta=\tan ^{-1}\left(\frac{10}{18}\right)=29^{\circ}
$$

11. A second, different right triangle has an hypotenuse $\mathrm{c}=15$ and an angle $\theta=25^{\circ}$. What is the length of the shortest leg of this triangle?

$$
a=(15) \sin 25^{\circ}=6.34
$$



$$
\begin{aligned}
& \sin \theta=\frac{\text { opposite }}{\text { hypotenuse }} \\
& \cos \theta=\frac{\text { adjacent }}{\text { hypotenuse }}
\end{aligned}
$$

$$
\tan \theta=\frac{\text { opposite }}{\text { adjacent }}
$$

A) 6.34
B) 7.00
C) 13.6
D) 15.0
E) 16.6
$a^{2}+b^{2}=c^{2}$

