

NAME: _____ Score _____/10

Please **print** your name**SHOW ALL YOUR WORK IN A NEAT AND ORGANIZED FASHION**

1. T **F** Two equations are equal if they have the same solution sets.
2. T **F** The set of rational numbers contains the set of integers and the set of natural numbers.
3. T **F** If A and B are sets, then $A = B$ if and only if $A \subset B$ and $B \subset A$.
4. T **F** If both sides of an equation are multiplied by the same expression, the resulting equation is equivalent to the original equation.
5. A formula must be an **equation**.
6. If two expressions represent the same quantity, then the two expressions must be **equal**.
7. Use interval notation to describe the set $[-2, 6] \cap (3, 7)$ as a single interval.
 $[-2, 6] \cap (3, 7) = (3, 6]$
8. (2 pts). A cylindrical can has a volume of $200\pi \text{ cm}^3$ and a radius of 4 cm. What is its height? Make sure you show the details. Your analysis should make it clear how you obtained the model/equation. Write your conclusion in ordinary English.

$$\text{Use } V = \pi r^2 h$$

$$200\pi = \pi 4^2 h$$

$$h = \frac{200\pi}{16\pi} = \frac{100}{8} 12.5$$

The can is 12.5 cm tall.

Here is an alternate presentation

$$\text{Use } V = \pi r^2 h$$

$$\text{If the radius is 4, then } V = 16\pi h$$

$$\text{A given fact is } V = 200\pi$$

Because we have two expressions for V, they must be equal which yields the equation

$$200\pi = 16\pi h \text{ which may be solved for h to obtain 12.5}$$

The can is 12.5 cm tall.

