College and Advanced Algebra | Nueva Vizcaya State University | Midterm Exam
O. D. Hombrebueno | College of Teacher Education | October 12, 2018

Name: _____

Course and Year: _____

Part 1. Insert $\in$ or $\notin$ in the blank to make the statement correct.

1. 15 ____N
2. 1.4142 ____H
3. 0 ____Q
4. 2007 ____J
5. -5 ____H

Part 2. Use the symbol $\subseteq$ to give a correct statement involving the two sets.

1. N and Q
2. R and Q
3. J and N
4. H and R
5. 0 and J

Part 3. Determine which of the sets N, J, Q, H, R, and $\emptyset$ is equal to the given set.

1. $Q \cap R$
2. $H \cap R$
3. $Q \cup R$
4. $H \cap Q$
5. $J \cap N$

Part 4. Use set builder notation and one or more of the symbols $<$, $>$, $\leq$, and $\geq$ to denote the set.

1. The set of all y between -12 and -3.
2. The set of all y such that y is greater than or equal to -26 and less than -16.
3. The set of all x such that $2x + 4$ is nonnegative.
4. The set of all a such that $a - 2$ is greater than -5 and less than or equal to 7.
5. The set of all z such that $2z + 5$ is between and including -1 and 15.

Part 5. Show the set on the number line and represent the set by interval notation.

1. $\{x| -4 < x \leq 4\}$
2. $\{x|x > 2 \text{ and } x < 12\}$
3. $\{x|x < 3 \text{ or } x > 6\}$
4. $\{x|x \geq -5\} \cap \{x|x \leq 5\}$
5. $\{x|x > 2\} \cup \{x|x > 10\}$

Part 6. Write the number without absolute value bars.

1. $|3 - \sqrt{3}|$
2. $\left|-\frac{3}{4}\right|$
3. $\left|\frac{1}{3}\right|$
4. $|-8|$
5. $|3 - \pi|$

Part 7. Use laws of exponents to write the expression so that each variable occurs only once and all the exponents are positive. None of the denominators is zero.

1. $a^{-3} \cdot a^6$
2. $\dfrac{y^5}{y^{-7}}$
3. $(s^5 t^{-1})^{-2}$
4. $\left(\dfrac{x^{-1}}{y^3}\right)^{-4}$
5. $-7(-x^6 y)(-x^6 y^5)$
6. $(2x^2)^3(3y^3)^2$
7. $(4s^4)^4(2t^3)^3$

8. $\dfrac{(20r^2s^3t^4)(2r^2s^2t)}{(-4rst)(3rs^4t^2)}$

9. $\dfrac{3^{-2}x^{-4}y^0}{(3x^2y^3)^{-4}}$

10. $\left(\dfrac{3x^{-1}y^2z^3}{2x^{-3}y^{-2}z^{-1}}\right)^{-1}$