

Math 172 – Quiz #1

October 4, 2013

Name: Solution Set

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Total: 40 points

Part A: For these short-answer questions, it is not necessary to show any work. Place your final answer in the space provided. Each answer is worth one point.

1. List **all** of the sets (R, Q, I, N, W, and Z) that the following numbers belong to.

- | | |
|------------------|------------|
| a) -7 | <u>RQZ</u> |
| b) 0.7 | <u>RQ</u> |
| c) -0.7 | <u>RQ</u> |
| d) $\sqrt{7}$ | <u>RI</u> |
| e) $\frac{1}{7}$ | <u>RQ</u> |

2. Given $A = \{0\}$, $B = \{2,4,6\}$, $C = \{x \mid x \text{ is a positive integer}\}$, find:

- | | | |
|--------------------------------|---------------------------------|--|
| a) $A \cap B$ | $= \{1, 2, 3, \dots\}$
$= N$ | <u>\emptyset or $\{ \}$</u> |
| b) $A \cup C$ | | <u>W or $\{0, 1, 2, \dots\}$</u> |
| c) $A \cup (B \cap C)$ | $B \cap C = B$ | <u>$\{0, 2, 4, 6\}$</u> |
| d) $\emptyset \cup (C \cup N)$ | $C \cup N = N$ | <u>C or N or $\{1, 2, 3, \dots\}$</u> |

3. Determine whether each of the following statements is True or False:

- | | |
|---------------------------|----------|
| a) $\sqrt{2} \in R$ | <u>T</u> |
| b) $W \subseteq N$ | <u>F</u> |
| c) $Q \cap I = R$ | <u>F</u> |
| d) $\emptyset \cup W = W$ | <u>T</u> |
| e) $\{-3\} \subseteq Z$ | <u>T</u> |

4. State whether the following equations are true or false for all real numbers:

a) $-(4 - y) = y - 4$

T

b) $(a + b)^2 = a^2 + b^2$

F

c) $x - (y - z) = (x - y) - z$

F

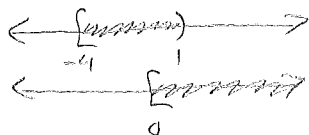
d) $\frac{k+5}{k} = 5$

F

5. Write each union or intersection as a single interval, if possible. If it can't be written as a single interval, write the original interval in the space provided. If the answer is the empty set, say so.

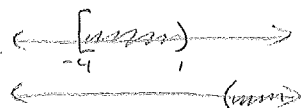
a) $[-4, 1) \cap [0, \infty)$

$[0, 1)$



b) $[-4, 1) \cap [2, \infty)$

\emptyset



Part B: For these questions, show your work and place your final answer in the space provided. Each answer is worth 2 points.

6. Evaluate each of the following expressions. Reduce any fractions to lowest terms.

a) $-20 \div \left(-\frac{5}{4}\right) + 18 \div \sqrt{4}$

25

$$-20 \left(\frac{-4}{5}\right) + \frac{18}{2}$$

$$16 + 9$$

$$25$$

b) $(4-1)^3 - \sqrt{10^2 - 8^2}$

21

$$3^3 - \sqrt{100 - 64}$$

$$27 - \sqrt{36}$$

$$21$$

$$c) \frac{12-2 \times 4}{12-(-8)} = \frac{12-8}{12+8} = \frac{4}{20} = \frac{1}{5}$$

$$\frac{1}{5} \text{ or } 0.2$$

$$d) 24 \div \frac{4}{3} \times (-10) \div \frac{1}{2} \div (-3)$$

$$\underline{120}$$

$$24 \cdot \left(\frac{3}{4}\right) \cdot (-10) \cdot 2 \cdot \left(-\frac{1}{3}\right) =$$

$$120$$

$$e) -40(0.2) - (0.8)(0.1)$$

$$\underline{-8.08}$$

$$-8 - 0.08$$

$$-8.08$$

$$\frac{40}{0.2} \text{ or } 40\left(\frac{2}{10}\right) = 8$$

$$8.0$$

$$f) -3^2 \div \left(\frac{1}{3^2}\right) + 33 \div 1.1$$

$$\underline{-51}$$

$$-9 \cdot \frac{9}{1} + 33 \div \frac{11}{10}$$

$$-81 + 33 \cdot \left(\frac{10}{11}\right)$$

$$-81 + 30$$

$$\rightarrow -51$$

$$g) \sqrt{b^2 - 4ac}, \text{ where } b \text{ and } c \text{ are equal to } -1 \text{ and } a \text{ equals } 12$$

$$\underline{7}$$

$$\sqrt{b^2 - 4ac} = \sqrt{(-1)^2 - 4(12)(-1)}$$

$$= \sqrt{1 + 48}$$

$$= \sqrt{49}$$

$$= 7$$

7. Simplify the following algebraic expressions. You may leave your answer in decimal form.

a) $\frac{24-36m}{-6} - \frac{48m-60}{-12}$

$$\frac{10m-9}{1}$$

$$-4 + 6m - (-4m + 5)$$

$$-4 + 6m + 4m - 5$$

$$10m - 9$$

②

b) $12y(1+2x) - 8x(3y-x)$

$$\frac{8x^2 + 12y}{1}$$

$$12y + 24xy - 24xy + 8x^2$$

$$\text{or } 4(2x^2 + 3y)$$

$$8x^2 + 12y$$

②

c) $0.2(25p-5q) - 10(0.5q-p)$

$$\frac{15p - 6q}{1}$$

$$5p - q - 5q + 10p$$

$$15p - 6q$$

②