

Math-8 Exam #1

Name: _____

This exam is closed book and notes. You may use a calculator; however, no other electronics are allowed. Show all work; there is no credit for guessed answers. All answers should be in exact values, unless you are specifically asked for an approximate value.

- 1). Identify each subset of the real numbers and give an example of an element from each set.

subset	name	example
\mathbb{N}	_____	_____
\mathbb{Z}	_____	_____
\mathbb{Q}	_____	_____
\mathbb{R}	_____	_____

- 2). Mark each of the following statement as either (T)rue or (F)alse. If false, provide a counterexample to show why the statement is false.

a). $\mathbb{N} \subseteq \mathbb{Q}$

b). Every integer is also a rational number.

c). Every rational number is an integer.

d). Every rational number is a fraction.

e). Every fraction is a rational number.

3). Give an example of an integer that is not a natural number.

4). Give an example of a real number that is not a rational number.

5). List the three possible forms of a rational number:

a). _____

b). _____

c). _____

6). Convert to fractional form. You do not need to reduce:

a). 12.345

b). $12.\overline{345}$

7). Graph the following two sets on a number line. Don't bother with scale; relative positioning of the endpoints is OK:

a). $\{x \in \mathbb{R} \mid -1 \leq x \leq 3\}$

b). $\{x \in \mathbb{Z} \mid -1 \leq x \leq 3\}$

8). Perform the following calculations:

a). Determine the prime factorization for 60.

b). Determine the prime factorization for 126.

c). Calculate using the LCM of 60 and 126:

$$\frac{3}{126} - \frac{5}{60}$$

d). Reduce using the GCD of 60 and 126:

$$\frac{126}{60}$$

9). Solve for x :

$$x - 3(2x + 3) = 8 - 5x$$

10). Solve for x :

$$\frac{1}{x-3} + \frac{3}{x+3} = \frac{10}{x^2-9}$$