

Name \_\_\_\_\_ Sec. no. \_\_\_\_\_

Do all work in the space provided within each question group. No calculator use. *Reduce all answers to lowest terms when appropriate.*

1. a) Express the set of real numbers  $\mathbb{R}$  as the *union* of two subsets (give symbols and names):

b) Circle all the *irrational* numbers in the list below:

$$7\pi \qquad 9.\overline{15} \qquad \frac{\sqrt{3}}{6} \qquad -4.111\dots \qquad \frac{1}{8} \qquad 1^0$$

c) Give an example of two *composite* numbers that are *relatively prime*:

d) The fraction  $1\frac{5}{6}$  is equivalent to the decimal \_\_\_\_\_ and the percentage \_\_\_\_\_.

2. Perform the operations and give the answer in lowest terms:

a)  $14\frac{1}{10} - 9\frac{2}{5}$

b)  $10\frac{4}{5} \cdot 3\frac{3}{4} =$

c)  $\frac{\frac{2}{3}}{\frac{4}{27}}$

3. a) Graph the absolute value equality and inequalities on the number line:

$$|x| = 5 \quad \text{_____}$$

$$|x| > 2 \quad \text{_____}$$

$$|x| \leq 4\frac{1}{2} \quad \text{_____}$$

4. Evaluate the following, expressing the answer in simplest form:

a)  $\frac{|7-23|+|8-12|}{-|-2|} =$

b)  $-4^2 + \sqrt{144} - 9 - (-17) - (5-2)^{-1} =$

c)  $\sqrt[3]{a} + b^{-1} + \frac{2}{c}$ , when  $a = -1000$ ,  $b = 1/5$ ,  $c = 0.1$

5. Reduce each expression to its simplest form, leaving no negative exponents:

a)  $\frac{x-1}{1-x} \cdot \frac{y+2}{y-2}$

b)  $\frac{380xy^2}{19x^6y}$

c)  $\left(\frac{49x^3y^{-4}}{121x^{-9}y^2}\right)^{-1/2}$

6. Simplify each radical expression:

a)  $\sqrt{50x^6y^5}$

b)  $\sqrt[3]{-32x^{11}y^4}$

c)  $\sqrt{8} + \sqrt{1000} - 7\sqrt{18} - \sqrt{360}$

d)  $\sqrt[5]{\frac{-1}{243}}$

e)  $\frac{9x}{\sqrt{6}}$  (rationalize the denominator)

7. Rewrite each false statement to make it true:

a)  $-\left(\frac{c}{d}\right) = \frac{-c}{-d}$

b)  $\left(\frac{x}{3}\right)^{-1} = \frac{-1}{3x}$

c)  $\sqrt{100-36} = \sqrt{100} - \sqrt{36}$

d)  $\sqrt[n]{a^m} = a^{\frac{n}{m}}$

e)  $\left(\frac{1}{a} + \frac{1}{b}\right)^{-1} = a + b$

f)  $|x + y| = |x| + |y|$