First name: _____ Last name: _____ ID: _____

Rational Numbers and Exponents Homework

1. Evaluate. Show work! No decimals!

a) $-2\frac{1}{3}-\left(-\frac{2}{3}\right)^2$ **b)** $\left(\left(-2\frac{1}{2}\right)^2\right)^2$ **c)** $3\frac{1}{5}\times\left(\frac{1}{4}-1\frac{1}{3}\right)$

d) $\frac{3}{4}-\left(\frac{-1}{2}\right)\left(\frac{5}{8}\right)\div\left[\left(\frac{-1}{4}\right)\left(\frac{-1}{4}\right)\right]$ **e)** $5.25\left(-2\frac{7}{8}\right)-8.5\left(-3\frac{3}{4}\right)$

2. Fill in the blanks.

a) $-1\frac{2}{3}+$ = 1 b) $-1\frac{2}{3}\times$ = 1

c) $-1\frac{2}{3}-$ = 1 d) $-1\frac{2}{3}\div$ = 1

3. For each of the numbers below, decide whether it is rational or irrational. Explain your reasoning in detail.

Numbers	**Rational? (Yes / No)**	**Reason**
5		
$\frac{5}{7}$		
$0.\overline{575}$		
$\sqrt{5}$		
$6+\sqrt{12}$		
$\frac{\sqrt{10}}{2}$		
5.751435402124 …		

4. Write each number in scientific notation.

1) 0.000006 2) 5400000 3) 60 4) 0.009

5) 6700000 6) 0.0000002012 7) 104000000 8) 0.827×10^9

Word problems

1. a) Natasha can shape an apple pie shell in $\frac{3}{4}$ minutes. How many could she shape in 3 hours?

b) Alicia needs $1\frac{2}{3}$ minutes to shape a pizza shell. How many could she shape in 3 hours?

c) Refer to a) and b). How much longer would it take Alicia to shape 100 shells than Natasha?

2. To change from Fahrenheit to Celsius, we use the formula $C = \frac{5}{9}[F - 32]$. Determine the Celsius temperature equivalent to -5.5°F. Use fractions only!

3. Assume that b is a positive integer. Is $-b(-b)^2$ positive, negative, or 0? Explain.

4. Evaluate the expression $5x^3 - 2x^2$ when $x = -1\frac{2}{3}$.

5. Express 64^3 with a base of 4. Express $(-27)^5$ with a base of -3.

6. $1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2}}}$ is an example of continued fraction. Evaluate this continued fraction.