

Math 1165: Homework
Due: Tuesday, October 16th

1) Consider the following numbers:

$$\frac{1}{47} \quad \text{and} \quad \frac{1}{78125}$$

For each, determine whether the decimal representation terminates or repeats, **without** actually computing the decimal representation. Explain your reasoning. If the decimal repeats, indicate and explain what the maximum possible number of digits in the repeating pattern is.

2) For each of the following statements, indicate whether the expression is a “rational number,” an “irrational number,” or whether it could be either.

- (a) rational + rational =?
- (b) rational + irrational =?
- (c) irrational + irrational =?
- (d) rational · rational =?
- (e) rational · irrational =?
- (f) irrational · irrational =?

Give careful explanations for parts (a), (e), and (f).