Classifying Rational and Irrational Numbers

1. For each of the numbers below, decide whether it is rational or irrational.

   Explain your answers.

Number	Reasoning
0.21	
$\dfrac{3}{12}$	
$\sqrt{12} - 2$	
$\dfrac{\sqrt{12}}{4}$	
4.125...	
$(\sqrt{12} - 4)(4 + \sqrt{12})$	
12.52 (rounded to 2 d.p.)	

2. Some students were classifying numbers as rational and irrational.

Decide whether you agree or disagree with each statement.

Correct any errors. Explain your answers clearly.

Student	Statement	Agree or disagree?
Otis	$\dfrac{\sqrt{3}}{8}$ is a rational number because it can be written as a fraction.	
Lulu	$\dfrac{\sqrt{3}}{8}$ is irrational because $\sqrt{3}$ is irrational.	
Leon	$0.\overline{286}$ is rational because you can write it as the fraction $\dfrac{286}{1000}$.	
Joan	$0.\overline{286}$ is an irrational number because that decimal will carry on forever.	
Ray	0.286 (rounded to three decimal places) might be rational or irrational.	
Arita	0.286… is rational - the little dots show the digits carry on in the same pattern forever.	