## Unit 8 Lesson 15 Cumulative Practice Problems

1. Elena and Han are discussing how to write the repeating decimal $x=0.13\overline{7}$ as a fraction. Han says that $0.13\overline{7}$ equals $\frac{13764}{99900}$. “I calculated $1000x=137.77\overline{7}$ because the decimal begins repeating after 3 digits. Then I subtracted to get $999x=137.64$. Then I multiplied by $100$ to get rid of the decimal: $99900x=13764$. And finally I divided to get $x=\frac{13764}{99900}$.” Elena says that $0.13\overline{7}$ equals $\frac{124}{900}$. “I calculated $10x=1.37\overline{7}$ because one digit repeats. Then I subtracted to get $9x=1.24$. Then I did what Han did to get $900x=124$ and $x=\frac{124}{900}$.”
* Do you agree with either of them? Explain your reasoning.
1. How are the numbers $0.444$ and $0.\overline{4}$ the same? How are they different?
	1. Write each fraction as a decimal.
		1. $\frac{2}{3}$
		2. $\frac{126}{37}$
	2. Write each decimal as a fraction.
		1. $0.\overline{75}$
		2. $0.\overline{3}$
2. Write each fraction as a decimal.
	1. $\frac{5}{9}$
	2. $\frac{5}{4}$
	3. $\frac{48}{99}$
	4. $\frac{5}{99}$
	5. $\frac{7}{100}$
	6. $\frac{53}{90}$
3. Write each decimal as a fraction.
	1. $0.\overline{7}$
	2. $0.\overline{2}$
	3. $0.1\overline{3}$
	4. $0.\overline{14}$
	5. $0.\overline{03}$
	6. $0.6\overline{38}$
	7. $0.52\overline{4}$
	8. $0.1\overline{5}$
4. $2.2^{2}=4.84$ and $2.3^{2}=5.29$. This gives some information about $\sqrt{5}$.
* Without directly calculating the square root, plot $\sqrt{5}$ on all three number lines using successive approximation.
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