***Fractions and Decimals Investigation***

Some fractions have terminating decimals, some fractions do not. Is there a way to look at a fraction and tell if the decimal equivalent will be terminating or repeating?

Start by competing the following table, test some results of your own and try and come up with a rule as to why some fractions terminate while others do not.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Fraction** | **Decimal** | **T or R** | **Fraction** | **Decimal** | **T or R** |
| $$\frac{1}{2}$$ | **0·5** | **T** | $$\frac{1}{15}$$ |  |  |
| $$\frac{1}{3}$$ | **0·333…** | **R** | $$\frac{1}{16}$$ |  |  |
| $$\frac{1}{4}$$ |  |  | $$\frac{1}{20}$$ |  |  |
| $$\frac{1}{5}$$ |  |  | $$\frac{1}{24}$$ |  |  |
| $$\frac{1}{6}$$ |  |  | $$\frac{1}{25}$$ |  |  |
| $$\frac{1}{7}$$ |  |  | $$\frac{1}{30}$$ |  |  |
| $$\frac{1}{8}$$ |  |  | $$\frac{1}{32}$$ |  |  |
| $$\frac{1}{9}$$ |  |  | $$\frac{1}{35}$$ |  |  |
| $$\frac{1}{10}$$ |  |  | $$\frac{1}{40}$$ |  |  |
| $$\frac{1}{12}$$ |  |  | $$\frac{1}{50}$$ |  |  |

What happens when the denominator is even? odd? prime? multiple of 5?

What is your final hypothesis? Why do you think it is so?

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