***Converting a Fraction to a Decimal***

To convert a fraction to a decimal, divide the numerator by the denominator.

To convert a fraction to a decimal, write an equivalent fraction (if possible) whose denominator is 10, 100, or 1000.

Remember that the numerator is the dividend and the denominator is the divisor.

**A terminating decimal** is a decimal with a finite number of digits after the decimal point.

**A repeating decimal** is a decimal in which one digit or a group of digits is repeated without end.

**Sample Problem 1**: **Convert each fraction to a decimal, then determine if its decimal expansion is repeating or terminating.**

|  |  |  |  |
| --- | --- | --- | --- |
| **a.**  | $$\frac{3}{4}$$ | **b.**  | $$\frac{3}{11}$$ |
|  |  |  |  |
| **c.**  | $$\frac{12}{128}$$ | **d.**  | $$\frac{3}{16}$$ |
|  |  |  |  |

***Converting a Decimal to a Fraction***

A terminating decimal can be written as a fraction simply by writing it as decimal fractions.

**Sample problem 2: Convert each terminating decimal to a fraction.**

|  |  |  |  |
| --- | --- | --- | --- |
| **a.** | $$1.25$$ | **b.** | $$4.5 $$ |
|  |  |  |  |
| **c.** | $$0.04$$ | **d.** | $$-5.12$$ |
|  |  |  |  |

A repeating decimal can be written as a fraction.

Follow these steps, to change each repeating decimal to a fraction.

 **Step 1:** Let **𝑥** equal the repeating decimal.

 **Step 2:** Multiply by powers of 1, 10, or 100 to create 2 equations that isolate the repeating part of the decimal.

 **Step 3:** Subtract the equations to remove the repeating part of the decimal.

 **Step 4:** Solve the resulting equation and simplify the fraction.

**Sample problem 3: Convert each repeating decimal to a fraction.**

|  |  |  |  |
| --- | --- | --- | --- |
| **a.** | $$0.666666…….$$ | **b.** | $$1.252525…….. $$ |
|  |  |  |  |
| **c.** | $$0.181818…….$$ | **d.** | $$0.3717171717…….. $$ |
|  |  |  |  |