**6.6 – General Form of the Equation for a Linear Relation**

We can write an equation of a line in many different forms. We have looked at the slope-intercept form and point-slope forms so far.

**General Form of the Equation of a Line**

$$Ax+By+C=0$$

$$where A, B, and C are integers, and A is positive$$

**Example 1: Rewriting an Equation in Multiple Forms**

Fill in the table below.

|  |  |  |
| --- | --- | --- |
| **Slope-Intercept Form** | **Point-Slope Form** | **General Form** |
| $$y= \frac{1}{2}x+7$$ |  |  |
|  | $$y+3= -\frac{3}{5}\left(x-2\right)$$ |  |
|  |  | $$2x-3y+10=0$$ |

**Example 2: Finding the Slope of a Line with Its Equation in General Form**

Find the slope of the line with equation: $4x-3y-12=0$.

Rewrite the equation in slope intercept form:

$$-3y= -4x+12$$

$$y= \frac{4}{3}x-4$$

So, our slope is $ \frac{4}{3}$.

**Example 3: Using Intercepts to Graph a Line Given in General Form**

Graph the line $4x+y-8=0$ using the *x* and *y* intercepts.

When $x=0:$ $4\left(0\right)+ y=8$ When $y=0:$ $4x+\left(0\right)=8$

 $y=8$ $x=2$

**Example 4: Solving a Problem Using General Form**

Ning Ning is trying to save for college. During the summer, she works two babysitting jobs to earn her money. Job A pays her $6.75 per hour, and Job B pays her $7.75 per hour. On a given weekend, Ning Ning made $88.

a) Write an equation in general form to represent this situation.

Let *x* represent the number of hours worked at Job A.

Let *y* represent the number of hours worked at Job B.

The equation would be:

$$6.75x+7.75y-88=0$$

b) If Ning Ning can only work whole hours, would she be able to make $105 if she worked 12 hours at Job A and 3 hours at Job B?

Substitute to check:

$$6.75\left(12\right)+7.75\left(3\right)=105$$

$$81+23.25=105$$

$$104.25 \ne 105$$

Ning Ning would not be able to make exactly $105 if she worked 12 hours at Job A and 3 hours at Job B.