

## Agree/Disagree Reading- Equations of Lines

Put A in the blank if you agree with the statement. Put D if you disagree. After you have answered all the questions, turn the paper over and read the back, then check your answers.

- \_\_\_\_\_1. Equations of lines have 2 variables.
- \_\_\_\_\_2. A ordered pair represents a line on a coordinate plane.
- \_\_\_\_\_3. The x-axis is the vertical axis.
- \_\_\_\_\_4. The x-coordinate comes first in an ordered pair.
- \_\_\_\_\_5. The slope intercept form of an equation of a line is  $y=mx+b$
- \_\_\_\_\_6.  $m$  represents the steepness of the line.
- \_\_\_\_\_7. Slope is change in  $y$  over change in  $x$ .....or rise over run.
- \_\_\_\_\_8.  $b$  is the  $y$  intercept or  $(b,0)$
- \_\_\_\_\_9. Parallel lines have the same equations.
- \_\_\_\_\_10. Perpendicular lines have slopes that are negative reciprocals.
- \_\_\_\_\_11. You need slope and  $y$ -intercept to write the equation of a line.
- \_\_\_\_\_12. Point slope form of an equations of a line is  $y-y_1 = m(x-x_1)$
- \_\_\_\_\_13. If you have a point on the line and the slope, then you can find the equation of a line.
- \_\_\_\_\_14. If a line is vertical, then the slope is zero.
- \_\_\_\_\_15. If the equation of a line is  $y = 5$ , then the slope is zero.
- \_\_\_\_\_16. Parallel lines have slopes that are negative reciprocals.
- \_\_\_\_\_17. Perpendicular lines have slopes that are negative reciprocals.

## Equations of Lines

A line can be graphed on a coordinate plane and can represent many different real life situations. To identify a line we use an equation of the line. The equation of the line represents the set of all points  $(x, y)$  that lie on the line. There are infinitely many ordered pairs that satisfy the equation and are on the line. An equation of a line has two variables.

There are several different forms of an equation of a line. First is  **$y = mx + b$**  which is **slope intercept**. It is the easiest to use because you can see the slope and y intercept just by looking at the equation.  $m$  is the slope and  $b$  is the y intercept. The y-intercept is the place where the line crosses the y axis ---  $(0, b)$ . The second form is **point-slope,  $y - y_1 = m(x - x_1)$**  where  $m$  is the slope and  $(x_1, y_1)$  is a point on the line (not necessarily the y intercept). All you need to have to find the equation of a line is the slope and one point on the line, then you can use point-slope form! The third form of equation is  **$Ax + By = C$**  and is called **standard form**.

Slope is the steepness of a line and is a ratio of the rise to the run of a line. It is calculated by change in  $y$  over change in  $x$  or  $(y_1 - y_2)/(x_1 - x_2)$ . The steeper the line is, the larger the slope. If a line is horizontal, then the slope is zero and if a line is vertical, then the slope is undefined. Horizontal lines always have an equation  $y = b$ , where "b" is the y-coordinate of every point on the line. If you list the ordered pairs that are on a horizontal line, then the y coordinates will always be the same. Vertical lines have equations  $x = a$ , where "a" is the x coordinate of every point on the line. All points on a vertical line have the same x-coordinate.

Parallel lines have the same slope but different y intercepts. The slopes are the same because they have the same steepness. Perpendicular lines have slopes that are negative reciprocals. That means that if one line has a slope of  $2/3$  then the line perpendicular has a slope of  $-3/2$ .