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1. What is a linear equation? What is the key word of 'linear'?
2. Draw two points on the coordinate plane, label their coordinates, determine the slope (m) between them.
3. You've heard slope is "rise over run", and the classical equation is: $m = \dfrac{y_2 - y_1}{x_2 - x_1}$ Which isn't very succinct. Show that "Left y minus right y divided by left x minus right x" works for calculating slope.
4. Show that "Right y minus left y divided by right x minus left x" works for calculating slope. Why do these both work? Which one do you prefer?
5. Do other variations "work"? Why or why not?
6. For the two points you have, determine the slope-intercept form that is to say $y = mx+b$ between those two points. Solve for b by plugging in x and y, and the value of m found.
7. Find the slope-intercept form for another pair of coordinate points. Can you generalize?
8. Is this process doable for any two points? Be careful! (Recall that we cannot divide by some number.)
9. So we have slope-intercept form, but we also have something called standard form which is useful for solving linear systems in the form of $ax + by = c$. Re-arrange $2x + 3y = 12$ into slope-intercept form. Also graph this function.
10. Find the x and y intercepts of $2x+3y = 12$. What do you notice? Reminder x intercept is the coordinate point when $y = 0$ and the y intercept is the coordinate point when $x = 0$.
11. Graph two equations with the same slope. What do you notice?
12. Is it possible for these two equations to intersect? How do you know?
13. Graph the following set of equations:

$$y = 2x + 3 \qquad\qquad y = -\frac{1}{2}x - 4$$

What do you notice? What angle do they form?

14. Graph an equation that is parallel to: $y = \dfrac{3}{2}x - 1$. What is the equation of that line?
15. Graph an equation that is perpendicular to: $y = \dfrac{3}{2}x - 1$. What is the equation of that line?