

Week #1:

Review:

1. There are several equations to represent a linear function. We will use the point-slope form in this course, $y - y_1 = m(x - x_1)$ where (x_1, y_1) is a point on the line and m is the slope of the line. Find the point-slope equation of the line that passes through the points $(2, -7)$ and $(-1, 8)$.

$$f(x) = mx + b$$

$$\frac{-7-8}{2-(-1)} = \frac{-15}{3} = -5 \text{ slope}$$

$$f(x) = -5x + b$$

$$f(2) = -5(2) + b = -7$$

$$-10 + b = -7$$

$$b = 3$$

$$f(-1) = -5(-1) + b = 8$$

$$5 + b = 8$$

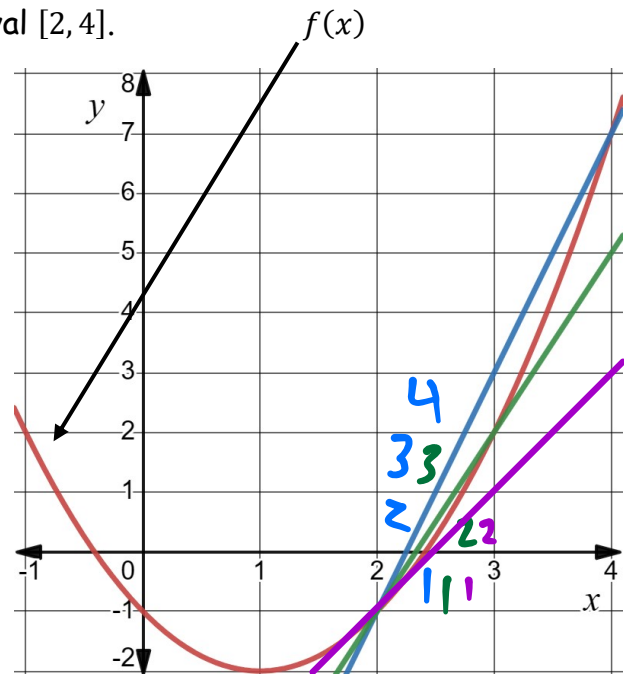
$$b = 3$$

$$f(x) = -5x + 3$$

2. A **secant line** is a line that passes through two points of a curve. A **tangent line** is a line that just touches a curve at one point. Both lines might intersect the curve at other points depending upon the shape of the curve, but we focus on the two points of interest for the secant line and one point of the tangent line. Given the graph of the function $f(x)$ below and the graphs of two secant lines starting at the point $(2, -1)$, find:

a. The slope of the blue secant line on the x-interval $[2, 4]$.

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b. The slope of the green secant line on the x-interval $[2, 3]$.

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c. Draw the tangent line at $(2, -1)$ and guess the slope of this line.

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