Characteristics of Linear Graphs

F.IF.4 Using tables, graphs, and verbal descriptions, interpret the key characteristics of a function which models the relationship between two quantities. Sketch a graph showing key features including: intercepts; interval where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

F.IF.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.

F.IF.7a Graph linear and quadratic functions and show intercepts, maxima, and minima (as determined by the function or by context).

What am I learning today?

How to describe the characteristics of a linear function and what they mean in context

How will I show that I learned it?

Graph a line from an equation and identify its characteristics

Characteristics: (***already been copied into notes***)

Domain: all possible inputs or x-values

Range: all possible outputs or y-values

Maximum: the highest point on the graph, the largest value of y.

Minimum: the lowest point on the graph, the smallest value of y.

X-Intercept: where the graph crosses the x-axis; where y = 0.

Y-Intercept: where the graph crosses the y-axis; where x = 0.

f(x) > 0: the **domain** where the graph is above the x-axis; where the graph is positive.

y > 0

f(x) < 0: the **domain** where the graph is below the x-axis; where the graph is negative.

y < 0

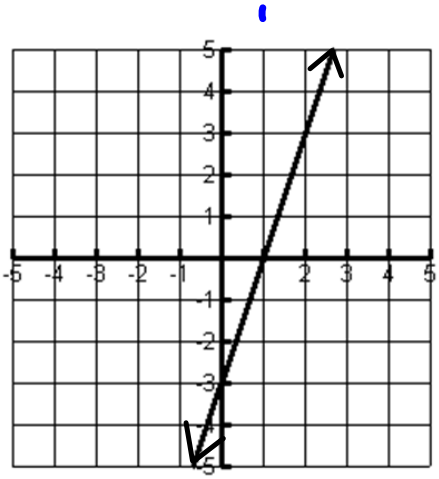
Interval of Increase: the **domain** where the values of y are going up; where the slope is positive.

Interval of Decrease: the **domain** where the values of y are going down; where the slope is negative.

Constant Inteval: the **domain** where the values of y are staying the same; where the slope is 0.

End Behavior: where the graph is headed as it leaves the visible coordinate plane.

Ex. B.



Domain: $-\infty < x < \infty$ or $\mathbb{R}$

Range: $-\infty < y < \infty$ or $\mathbb{R}$

Max: none

Min: none

X-Intercept: (1, 0)

Y-Intercept: (0, −3)

When is f(x) > 0 ? $y > 0$ $1 < x < \infty$

When is f(x) < 0 ? $y < 0$ $-\infty < x < 1$

read from left to right only use x-values

Interval of Increase: $-\infty < x < \infty$

Interval of Decrease: no

Constant Interval: no

positive Slope

Ex. C.

Domain: $-\infty < x < \infty$ or $\mathbb{R}$

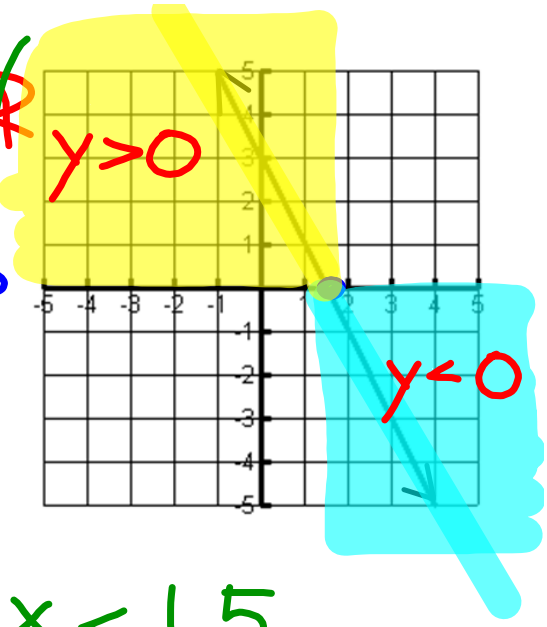
Range: $-\infty < y < \infty$

Max: none

Min: none

X-Intercept: (1.5, 0)

Y-Intercept: (0, 3)



When is $f(x) > 0$? $-\infty < x < 1.5$

When is $f(x) < 0$? $1.5 < x < \infty$

Interval of Increase: none

Interval of Decrease: $-\infty < x < \infty$

Constant Interval: nb