Economics 1021A—Tutorial 1 September 11, 2020

Chapter 1: What is Economics?
Chapter 1 Appendix: Graphs in Economics 15ab, 16, 17 (p. 32)

Use the following data to work Problems 15 to 17. Draw a graph that shows the relationship between the two variables *x* and *y*.

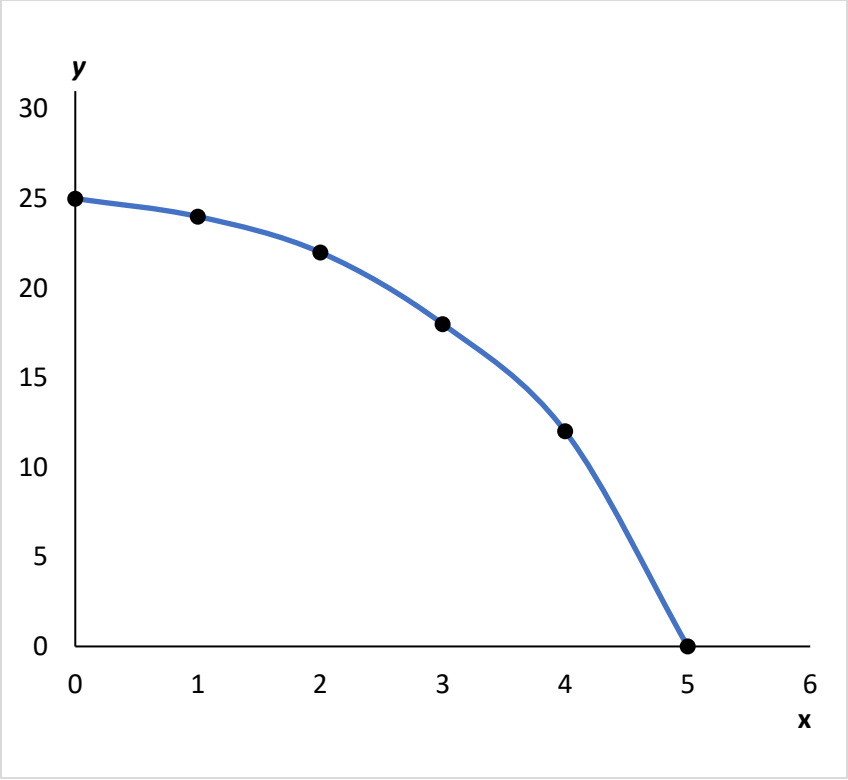
x	0	1	2	3	4	5
y	25	24	22	18	12	0

Problem 1A.15:

(a) Is the relationship positive or negative?
(b) Does the slope of the relationship become steeper or flatter as the value of *x* increases?

SOLUTION: Start by drawing the figure below. Plot the points and then connect them.

(a) As *x* increases, *y* decreases, so *x* and *y* move in opposite directions. The relationship between *x* and *y* is negative.
(b) The slope becomes steeper as *x* increases.
[Note: Feel free to draw in tangent lines to show that the slope is increasing as *x* increases.]



Problem 1A.16: Calculate the slope of the relationship between *x* and *y* when *x* equals 3.

SOLUTION: First, draw a tangent line at x = 3. The tangent line passes through the point (5, 10). [Note: I have included a picture below. Make sure your line passes through (5, 10)!]

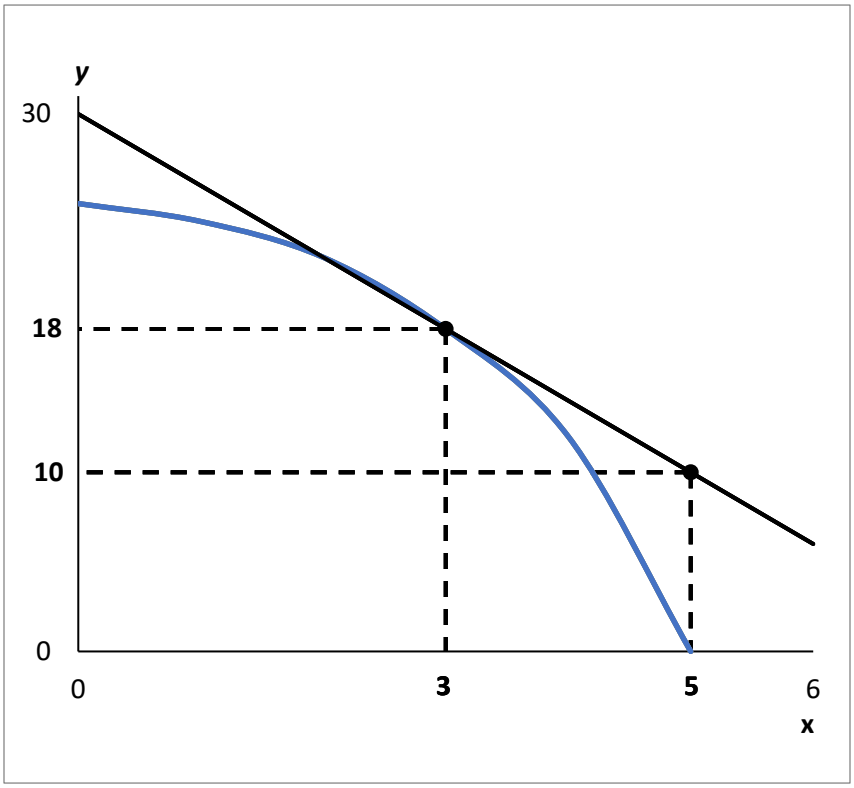
With two points, the slope can be calculated.

$$(x_1, y_1) = (3, 18)$$
$$(x_2, y_2) = (5, 10)$$

Write out the slope formula and compute.

$$\text{slope} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{10 - 18}{5 - 3} = \frac{-8}{2} = -4$$

Therefore, the slope is -4.



Problem 1A.17: Calculate the slope of the relationship across the arc as *x* increases from 4 to 5.

SOLUTION: We are calculating the slope between two points.

$$(x_1, y_1) = (4, 12)$$
$$(x_2, y_2) = (5,0)$$

Draw a line segment between the two points. Write out the slope formula and compute.

$$\text{slope} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0 - 12}{5 - 4} = \frac{-12}{1} = -12$$

Therefore, the slope is -12.