# Relations and functions

Science, Mathematics

Week Five Discussion: Relations and Functions The first equation, I have selected is f(x) = 4. The points on the graph of the first equation are (-7, 4), (-5, 4), (-3, 4), (-1, 4), (0, 4), (1, 4), (3, 4), (5, 4) and (7, 4). The equation does not involve any x-term; therefore, y value is same for all the points.

There is no x-intercept. The y-intercept is 4 that is at (0, 4). As such, there is no start/end point. This is because the graph of the equation goes to infinity (-∞ or +∞) both sides (left and right) of the y-axis.

The graph of the equation is a horizontal line 4 units above the x-axis and is located on I and II quadrants.

The domain (D) for the first equation is the set of all real numbers. In interval notation, this can be written as

D = (-∞, ∞)

The range (R) for the first equation is 4. In interval notation, this can be written as

R = [4]

The equation f(x) = 4 is a function as it passes the vertical line test.

The second equation, I have selected is x = (y + 2)^2. The calculations for the points on the graph are given below:

For y = 1, x = (1 + 2)^2 = (3)^2 = 9

For y = 0, x = (0 + 2)^2 = (2)^2 = 4

For y = -1, x = (-1 + 2)^2 = (1)^2 = 1

For y = -2, x = (1 + 2)^2 = (0)^2 = 0

For y = -3, x = (-3 + 2)^2 = (-1)^2 = 1

For y = -4, x = (-4 + 2)^2 = (-2)^2 = 4

For y = -5, x = (-5 + 2)^2 = (-3)^2 = 9

The points on the graph of the first equation are (9, 1), (4, 0), (1, -1), (0, -2), (1, -3), (4, -4) and (9, -5).

The x-intercept is 4 that is at (4, 0) and the y-intercept is -2 that is at (0, -2).

The vertex is at (0, -2). As such, there is no start/end point. This is because the graph of the equation goes to positive infinity (+∞) both sides (up and down) of the x-axis and intercept the y-axis at (0, -2).

The graph of the equation is a parabola and is located on I and IV quadrants.

The domain (D) for the second equation is the set of all real numbers greater or equal to 0. In interval notation, this can be written as

$D = [0, \infty)$

The range (R) for the second equation is the set of all real numbers. In interval notation, this can be written as

$R = (-\infty, \infty)$

The equation $x = (y + 2)^2$ is a relation as it does not pass the vertical line test.

I selected transformation of the first equation, f(x) = 4. When the equation is shifted three units upward, the new equation would be

$f(x) = 4 + 3 = 7$

And now shifting four points to the left the resulting equation would be

f(x) = 7(no change in the equation, as there is no x-term)

If the first equation, f(x) = 4 is shifted three units upward and four points to the left, the resulting transformed equation would be f(x) = 7. There is no x-intercept and the y-intercept is 7 that is at (0, 7).