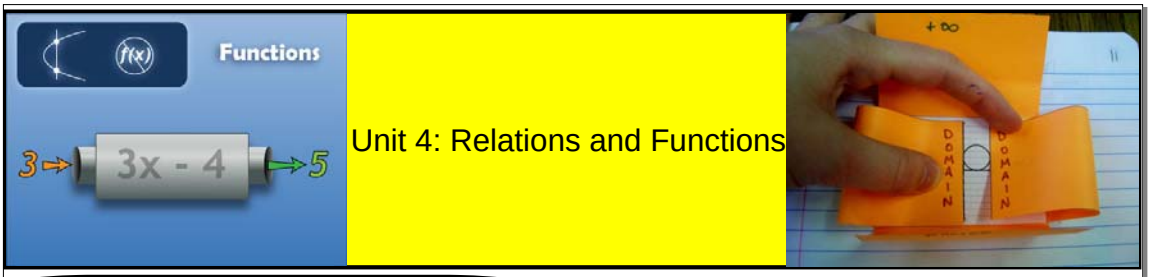


Unit 4: Relations and Functions

4.1 Intro to Relations and Functions

Cartesian Plane

y axis

Coordinate Grid

(−, +) Quadrant II

(+, +) Quadrant I

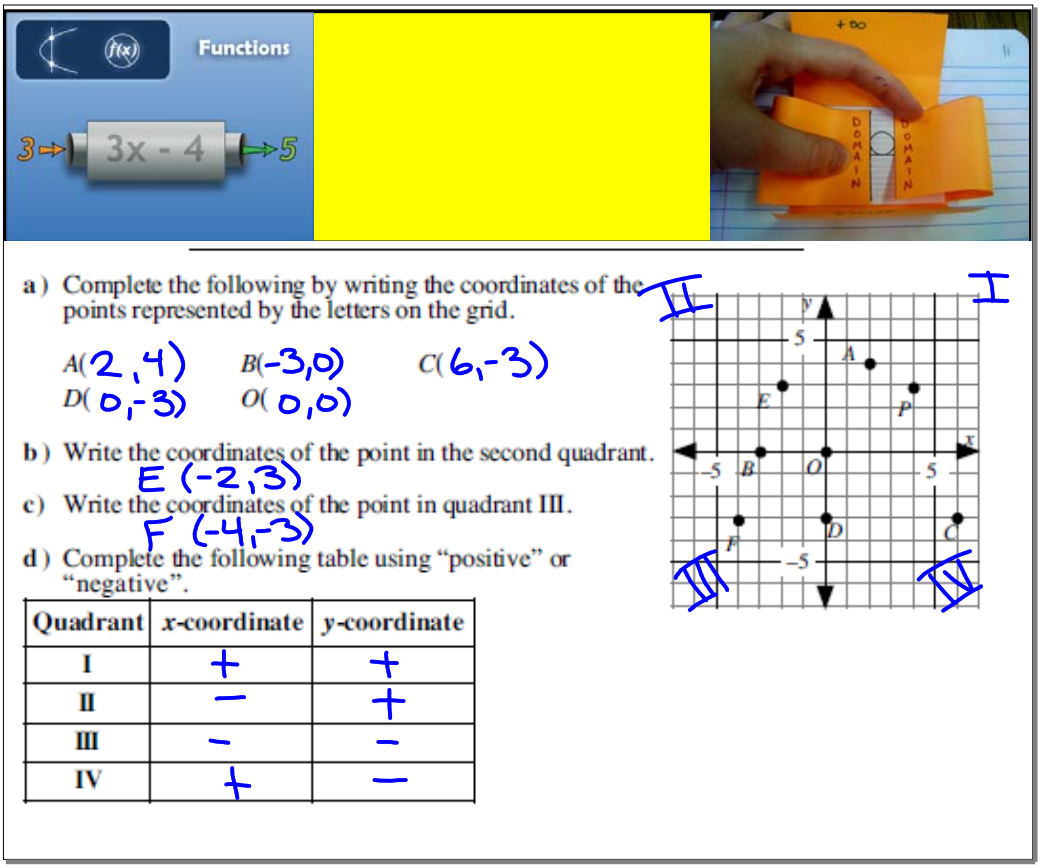
ordered pair/ coordinate (3,2)

(0,0) origin

x axis

(−, −) Quadrant III

(+, −) Quadrant IV



a) Complete the following by writing the coordinates of the points represented by the letters on the grid.

A(2, 4) B(−3, 0) C(6, −3)
D(0, −3) O(0, 0)

b) Write the coordinates of the point in the second quadrant.

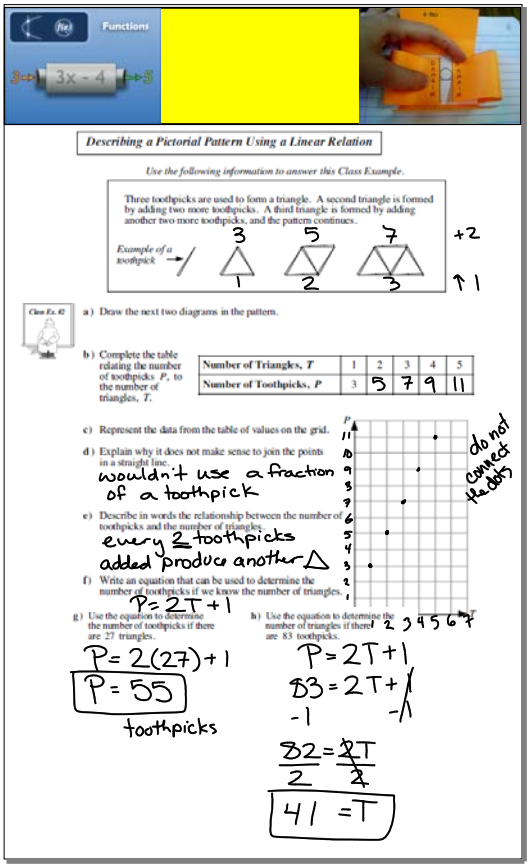
E (−2, 3)

c) Write the coordinates of the point in quadrant III.

F (−4, −3)

d) Complete the following table using "positive" or "negative".

Quadrant	x-coordinate	y-coordinate
I	+	+
II	−	+
III	−	−
IV	+	−



Describing a Pictorial Pattern Using a Linear Relation

Use the following information to answer this Class Example.

Three toothpicks are used to form a triangle. A second triangle is formed by adding two more toothpicks. A third triangle is formed by adding another two more toothpicks, and the pattern continues.

Example of a toothpick → 3, 5, 7 (+2); 1, 2, 3 (↑1)

Class Ex. #2

a) Draw the next two diagrams in the pattern.

b) Complete the table relating the number of toothpicks P, to the number of triangles, T.

Number of Triangles, T	1	2	3	4	5
Number of Toothpicks, P	3	5	7	9	11

c) Represent the data from the table of values on the grid.

d) Explain why it does not make sense to join the points in a straight line.
wouldn't use a fraction of a toothpick

do not connect the dots

e) Describe in words the relationship between the number of toothpicks and the number of triangles.
every 2 toothpicks added produce another △

f) Write an equation that can be used to determine the number of toothpicks if we know the number of triangles.
$P = 2T + 1$

g) Use the equation to determine the number of toothpicks if there are 27 triangles.

$P = 2(27) + 1$

$P = 55$ toothpicks

h) Use the equation to determine the number of triangles if there are 83 toothpicks.

$P = 2T + 1$

$83 = 2T + 1$

$-1 \quad -1$

$\frac{82}{2} = \frac{2T}{2}$

$41 = T$

Discrete and Continuous Variables

does 2.7345 make sense

In Class Example #3, the variables I and V are examples of **continuous variables** since they can take on every value within a particular interval, i.e. a variable for which it is possible to find an intermediate value between any two values. For the graph in this example, the current can take on any value between 0 and 5.

In Class Example #2, the variables P and T can only take on limited values (in this case whole number values) and are therefore NOT continuous variables. Such variables are called **discrete variables**.

A graph relating two discrete variables consists of a series of unconnected points, whereas in the graph of two continuous variables the points would be connected.

Class Ex. #4

Classify each of the following variables as discrete or continuous.

a) time taken to complete a 100 m sprint
continuous

b) number of students who pass Math 10
discrete

c) height of students
continuous.

d) shoe size
discrete