# Today's Learning Goal(s):

Date: _____
(**Every** lesson)

By the end of the class, I will be able to:

a) use function notation to represent linear and quadratic functions.

**We will take up Homework Questions from last day on the final slide.**

***Last day, I assigned an extra worksheet on Domain and Range.***

***I posted my solutions in our Google Classroom.***

***Also, I highly recommend that you print tomorrow's lesson in advance.***

# Today's Learning Goal(s):

Date: Feb 25/19
(Every lesson)

By the end of the class, I will be able to:

a) use function notation to represent linear and quadratic functions.

## 1.2 Function Notation

Function notation, such as $f(x)$, is used to represent the value of the dependent variable for a given value of the independent variable $x$.

$x$ is often called the input and $f(x)$ is called the output.

$f(x)$ is read "$f$ of $x$" or "$f$ at $x$"

Compared to the notation you have been used to $y$ and $f(x)$ are interchangeable.

Therefore $y = -3x + 4$ can be written as $f(x) = -3x + 4$

or $y = 2(x-3)^2 + 4$ can be written as $f(x) = 2(x-3)^2 + 4$

Ex. 1 If $f(x) = -x(x-6)$ then find:

a) $f(2)$

$= -(2)((2) - 6)$

$= -2(-4)$

$= 8$

b) $f(a)$

$= -(a)((a) - 6)$

$= -a(a-6)$

b2) $f(a-3)$

$= -(a-3)((a-3) - 6)$

$= -(a-3)(a-9)$

c) Find $x$ if $f(x) = -16$

$-16 = -x(x-6)$

$-16 = -x^2 + 6x$

$x^2 - 6x - 16 = 0$

$(x-8)(x+2) = 0$

$x - 8 = 0$ or $x + 2 = 0$

$x = 8$ $x = -2$

$\therefore f(8) = -16$ or $f(-2) = -16$

Ex. 2 Graph $f(x) = -x(x-6)$ is the same as...

$y = -x(x-6)$

$y = -x(x-6)$

x-int, let $y=0$

$0 = -x(x-6)$

$x=0$ or $x=6$

AOS: $x = \frac{0+6}{2}$

$= 3$

if $x=3$; $f(3)$

$f(3) = -(3)((3)-6)$

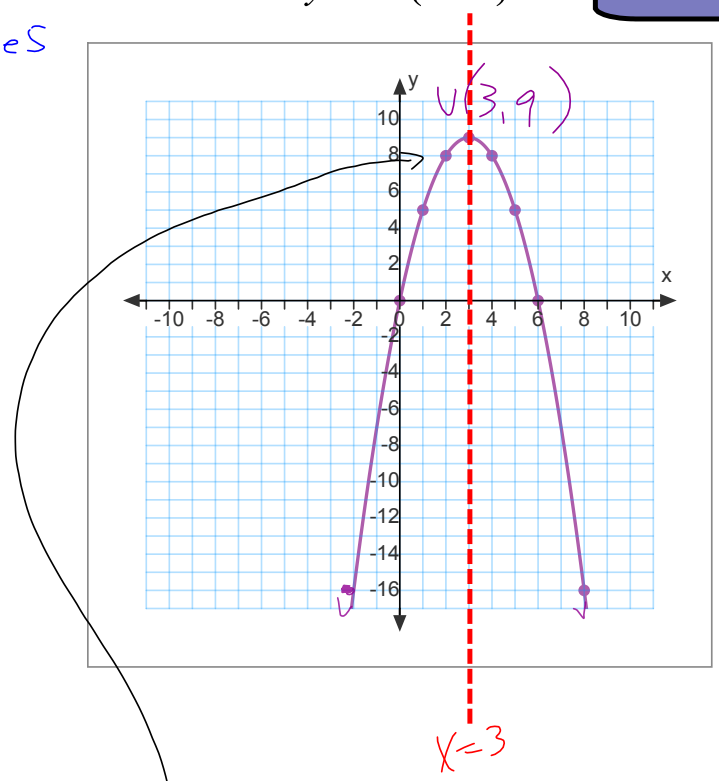
$= -3(-3)$

$= 9$

$\therefore (3,9)$ is the vertex

MG values

| over | up |
|---|---|
| 1 | 1 |
| 2 | 4 |
| 3 | 9 |




$f(2) = 8$ represents ....

the coordinate $(2,8)$ on the graph

Ex. 3 If $f(x) = x^2$ then find $f(x+4)$.

$f(x+4) = (x+4)^2$

$= x^2 + 8x + 16$

## Recall the 3 forms of quadratic functions:

| | |
|---|---|
| standard form | $y = ax^2 + bx + c$ |
| vertex form | $y = a(x-h)^2 + k$ |
| intercept form<br>factored form<br>zeros form | $y = a(x-r)(x-s)$<br>$= a(x-r_1)(x-r_2)$ |

Reviewing "completing the square" to find the vertex.

$y = -x(x-6)$

$= -x^2 + 6x$

$= -1(x^2 - 6x)$

$= -1(x^2 - 6x + 9 - 9)$

$= -1(x-3)^2 - 1(-9)$

$= -(x-3)^2 + 9$

$\therefore V(3, 9)$

$\left(\frac{b}{2}\right)^2$

$= \left(\frac{-6}{2}\right)^2$

$= (-3)^2$

$= 9$

**Are there any Homework Questions you would like to see on the board?**

Last day's work: *p. 2 #1 –8* 76

READ pp. 5-9

pp. 10-11 #1 –3, 6, 7a, 8, 9b

[p.13 #1-3]

pp. 35-36 #1 – 3, 5

Domain and Range Worksheets #1&2 #2

**Today's Homework Practice includes:**

pp. 22-23 #1, 2, 4 – 7, 9, 10

Funcon Notaon Worksheet #1 – 6

(answer keys are posted on the class ***Website***)

p. 2

**7.** For each **quadratic relation**, list the **transformations** you need to apply to $y = x^2$ to graph the relation. Then sketch the graph.

**a)** $y = x^2 - 2$ **c)** $y = \frac{1}{2}(x - 1)^2 - 4$

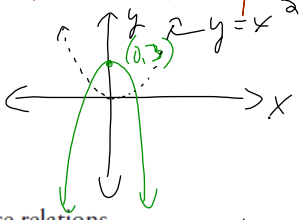
**b)** $y = -4x^2 + 3$ **d)** $y = -2(x + 3)^2 + 5$

a = -4

∴ reflection in the x-axis

vertical stretch by a factor of 4

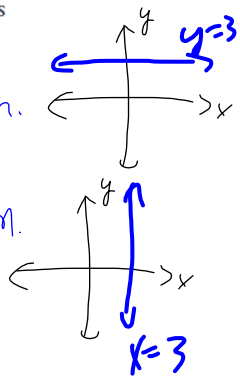
vertical translation 3 units up




p. 11 **6.** Describe the graphs of the relations $y = 3$ and $x = 3$. Are these relations functions? Explain.

$y = 3$ is a horizontal line, and IS A function.

$x = 3$ is a vertical line is is NOT a function.




p. 11 **8.** **a)** Substitute $x = 0$ into each equation and solve for $y$. Repeat for $x = -2$.

**i)** $3x + 4y = 5$ **iii)** $x^2 + y = 2$

**ii)** $x^2 + y^2 = 4$ **iv)** $x + y^2 = 0$

**b)** Which relations in part (a) appear to be functions?

**c)** How could you verify your answer to part (b)?

$x = -y^2$ ✗

i) $3(0) + 4y = 5$ ii) $(0)^2 + y^2 = 4$ iii) $(0)^2 + y = 2$ iv) $(0) + y^2 = 0$

$y = \frac{5}{4}$ $y = \pm 2$ $y = 2$ $y = 0$

b) appear to functions

i) Yes ii) NO iii) Yes iv) appears to be.

$x = 0$ $y = 2$ and $y = -2$

but is NOT a function ∴ y2