

SECTION 1.1 QUADRATIC FUNCTIONS

$$y = ax^2 + bx + c$$

- i) Xavier Method - Finding roots by factoring, vertex and axis of symmetry by average of roots
- ii) Domain and Range of QF
- iii) Quadratic Formula
- iv) Discriminant and the number of roots

REVIEW: LINEAR AND QUADRATIC FUNCTIONS

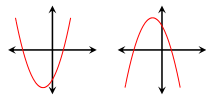
○ Linear Functions

-
-
-



○ Quadratic Functions

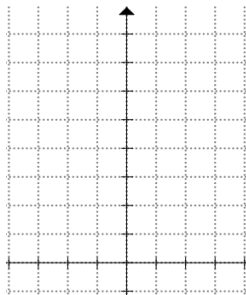
-
-
-
-



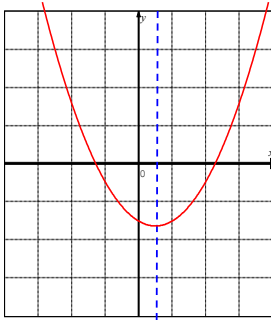
D) WHY IS A QUADRATIC FUNCTION U-SHAPED?

- If we make a TOV,

x	y
0	
1	
2	
3	
-1	
-2	
-3	



II) COMPONENTS OF A PARABOLA



Vertex:

Axis of Symmetry:

X intercepts:

Y intercept:

GRAPHING PARABOLAS WITH XAVIER'S METHOD

o First find the vertex using X.A.V.

X:

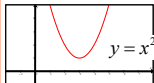
A:

V:

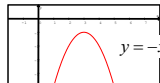
o

o

o



$$y = x^2 - 4x + 7$$



$$y = -x^2 - 3x - 13$$

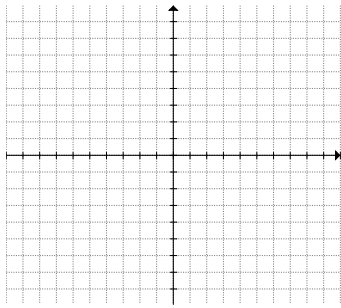
EX: FIND THE X INTERCEPTS, AXIS OF SYMMETRY, VERTEX AND GRAPH $y = x^2 - x - 6$

1st Factor: X intercepts

2nd Axis of Symmetry (Equation)

3rd Vertex: (Coordinates)

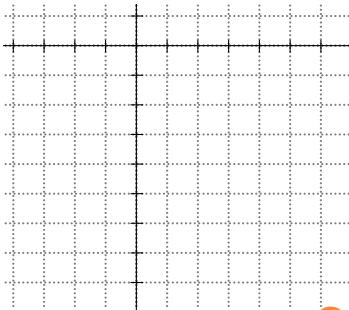
GRAPH: $y = x^2 - x - 6$



PRACTICE: FIND THE X INTERCEPTS, AXIS OF SYMMETRY, VERTEX AND GRAPH $y = 2x^2 + 3x - 9$



GRAPH: $y = 2x^2 + 3x - 9$



III) THE QUADRATIC FORMULA:

- We need to factor a quadratic equation in order to
- To do this, use either the
- However, if a quadratic equation can not be factored, use the

Ex: Use the Quadratic Formula to find the exact values of "x"

$$3x^2 - 7x - 8 = 0$$

EX: SOLVE FOR "X"

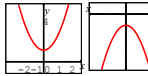
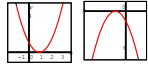
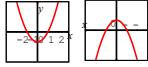
i) $3x^2 + 4x + 7 = 0$ ii) $(x+3)(5x+1) = (2x+1)(x+7)$

IV) DISCRIMINANT AND NATURE OF THE ROOTS

○ To determine the "Nature of the Roots" of a QF (aka: the **Number of X-intercepts**),

○ A Quadratic function can have either

- 2 distinct roots
- 2 equal roots
- No real roots



EX: DETERMINE THE NATURE OF THE ROOTS FOR EACH EQUATION: (DO NOT SOLVE)

i) $4x^2 - 7x + 8$

ii) $-3x^2 + 5x + 12$



III) WHERE DOES THE QF COME FROM?

○ Take the equation: $ax^2 + bx + c = 0$ and Complete the Square. Then Isolate "x"