

2.2 Interpreting Meaningful Values Given Real world Quad Graphs

parabola: a quadratic graph

KEY FEATURES of a parabola:

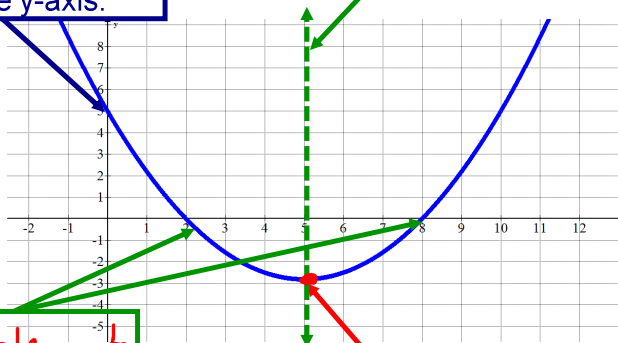
The y-intercept is where the parabola crosses the y-axis.

The line of symmetry is called the axis of symmetry.

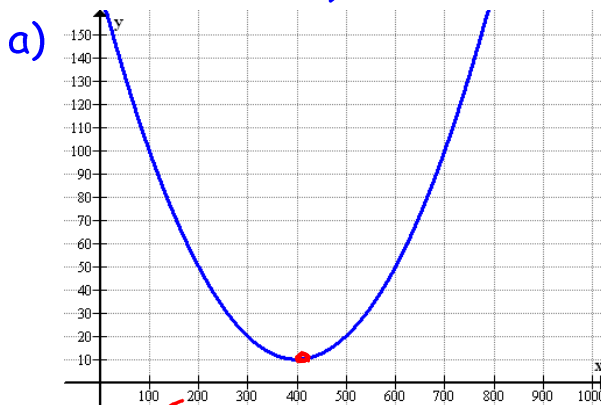
The x-intercepts are also called the zeros or roots.

The vertex.

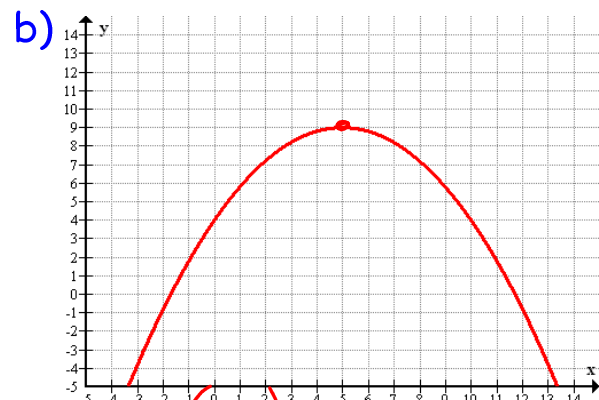
The y-coordinate of the vertex is either a maximum (highest value) or minimum (lowest value).



Ex 1: State: i) the coordinates of the vertex
 ii) if it is a maximum/minimum value
 iii) when does the max/min value occur



- i) vertex (400, 10)
 ii) ~~maximum~~/minimum value 10
 iii) when max/min value occurs 400



- i) vertex (5, 9)
 ii) ~~maximum~~/minimum value 9
 iii) when max/min value occurs 5

Ex 2: State: a) the coordinates of the vertex

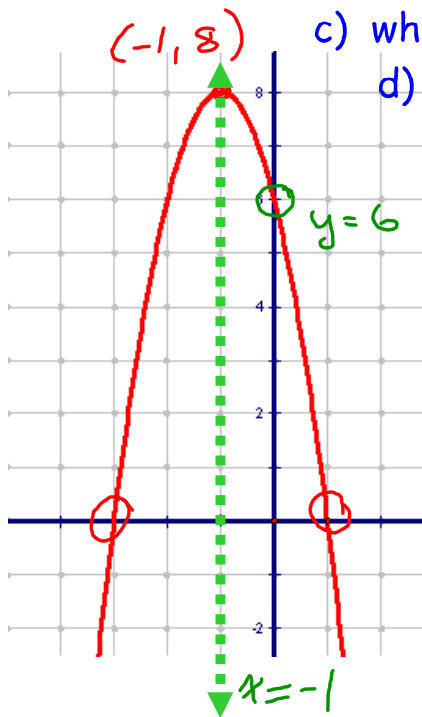
b) if it is a maximum/minimum value

c) when does the max/min value occur $x = -1$

d) circle the zero's they are $x = 1$ & $x = -3$

e) label the y-intercept

f) sketch the axis of symmetry



label
with the
equation

Ex 3: A model rocket is launched from the ground. The height of the rocket h , in metres, can be modeled by $h = -5t^2 + 100t$, where t is the elapsed time in seconds.



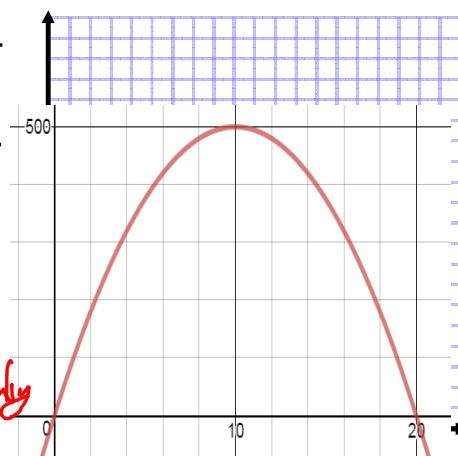
a) Graph the relation using **desmos**. make a sketch

b) At what height does the rocket start? 0m
this is the y-int.

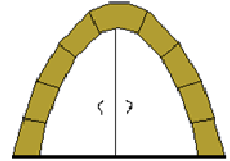
c) When does the rocket hit the ground? 20s
this is a x-int, zero

d) What is the maximum height the rocket reaches? 500m This is the maximum

e) When does the rocket reach the max height? 10s This is the axis of symmetry



Ex The shape of the underside of an arched doorway can be modeled by the equation $h = \frac{-1}{3}d^2 + 4d$



where h is the height, in feet, above the ground and d is the horizontal distance, in feet, from the edge of the arch.

a) Graph the relation using **desmos**. make a sketch and fill in the table of values.

d	h
0	0
2	6.7
4	10.7
6	12
8	10.7
10	6.7



- b) What is the height of the bridge ^{ft} 2m horizontally from the base? 6.7 ft
- c) What is the maximum height arch? 12 ft.
- d) How wide is the bridge at the base? 12 ft.

Practice:

- Handout 1-6
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