

[10-05-28-T8]
Quadratic function

A. Consider the function $y = f(x) = x^2$. Answer the following questions.

Sketch the graph of f .

- [1] What is the domain of the function f ?
- [2] What is the range of the function f ?
- [3] Does $f(x)$ take a minimum or a maximum value? If so, say whether maximum or minimum and state the value and the number x at which f takes that value?
- [4] Are there intervals in the functions domain on which the function is increasing or decreasing? If so, state the interval(s) and say whether f is increasing or decreasing on each such interval.
- [5] Is there a line with respect to which f is symmetric? If so, say which line.
- [6] Compared to the function $g(x) = x^2$, does $f(x)$ change more or less rapidly?

B. Consider the function $y = f(x) = -x^2$. Answer the following questions.

Sketch the graph of f .

- [1] What is the domain of the function f ?
- [2] What is the range of the function f ?
- [3] Does $f(x)$ take a minimum or a maximum value? If so, say whether maximum or minimum and state the value and the number x at which f takes that value?
- [4] Are there intervals in the functions domain on which the function is increasing or decreasing? If so, state the interval(s) and say whether f is increasing or decreasing on each such interval.
- [5] Is there a line with respect to which f is symmetric? If so, say which line.
- [6] Compared to the function $g(x) = x^2$, does $f(x)$ change more or less rapidly?

C. Consider the function $y = f(x) = 3x^2$. Answer the following questions.

Sketch the graph of f .

[1] What is the domain of the function f ?

[2] What is the range of the function f ?

[3] Does $f(x)$ take a minimum or a maximum value? If so, say whether maximum or minimum and state the value and the number x at which f takes that value?

[4] Are there intervals in the functions domain on which the function is increasing or decreasing? If so, state the interval(s) and say whether f is increasing or decreasing on each such interval.

[5] Is there a line with respect to which f is symmetric? If so, say which line.

[6] Compared to the function $g(x) = x^2$, does $f(x)$ change more or less rapidly?

D. Consider the function $y = f(x) = \frac{-1}{2}x^2$. Answer the following questions.

Sketch the graph of f .

[1] What is the domain of the function f ?

[2] What is the range of the function f ?

[3] Does $f(x)$ take a minimum or a maximum value? If so, say whether maximum or minimum and state the value and the number x at which f takes that value?

[4] Are there intervals in the functions domain on which the function is increasing or decreasing? If so, state the interval(s) and say whether f is increasing or decreasing on each such interval.

[5] Is there a line with respect to which f is symmetric? If so, say which line.

[6] Compared to the function $g(x) = x^2$, does $f(x)$ change more or less rapidly?