PROBLEMS AND SOLUTIONS - GRAPHS OF COMMON FUNCTIONS

Prepared by Ingrid Stewart, Ph.D., College of Southern Nevada
Please Send Questions and Comments to ingrid.stewart@csn.edu. Thank you!

PLEASE NOTE THAT YOU CANNOT ALWAYS USE A CALCULATOR ON THE ACCUPLACER - COLLEGE-LEVEL MATHEMATICS TEST! YOU MUST BE ABLE TO DO SOME PROBLEMS WITHOUT A CALCULATOR!

Problem 1:

Do the following for $g(x) = (x + 1)^3 + 1$.

a. Find its domain.
b. Find the coordinates of the point at which concavity changes or the function starts or there is a vertex
c. Find the coordinates of the x-intercept(s).
d. Find the coordinates of the y-intercept.
e. Graph the function.

Problem 2:

Do the following for $g(x) = 3|x - 1| + 2$.

a. Find its domain.
b. Find the coordinates of the point at which concavity changes or the function starts or there is a vertex
c. Find the coordinates of the x-intercept(s).
d. Find the coordinates of the y-intercept.
e. Graph the function.

Problem 3:

Do the following for $g(x) = (x + 3)^{1/3} + 2$.

a. Find its domain.
b. Find the coordinates of the point at which concavity changes or the function starts or there is a vertex
c. Find the coordinates of the x-intercept(s).
d. Find the coordinates of the y-intercept. Round to 1 decimal place.
e. Graph the function.

Problem 4:

Do the following for $g(x) = (x-2)^{2/3} - 4$.

a. Find its domain.
b. Find the coordinates of the point at which concavity changes or the function starts or there is a vertex
c. Find the coordinates of the x-intercept(s).
d. Find the coordinates of the y-intercept. Round to 1 decimal place.
e. Graph the function.

Problem 5:

Do the following for $p(x) = \sqrt{x+9} + 3$.

a. Find its domain.
b. Find the coordinates of the point at which concavity changes or the function starts or there is a vertex
c. Find the coordinates of the x-intercept(s).
d. Find the coordinates of the y-intercept.
e. Graph the function.

Problem 6:

Do the following for $h(x) = \sqrt{1-x} - 2$.

a. Find its domain.
b. Find the coordinates of the point at which concavity changes or the function starts or there is a vertex
c. Find the coordinates of the x-intercept(s).
d. Find the coordinates of the y-intercept.
e. Graph the function.

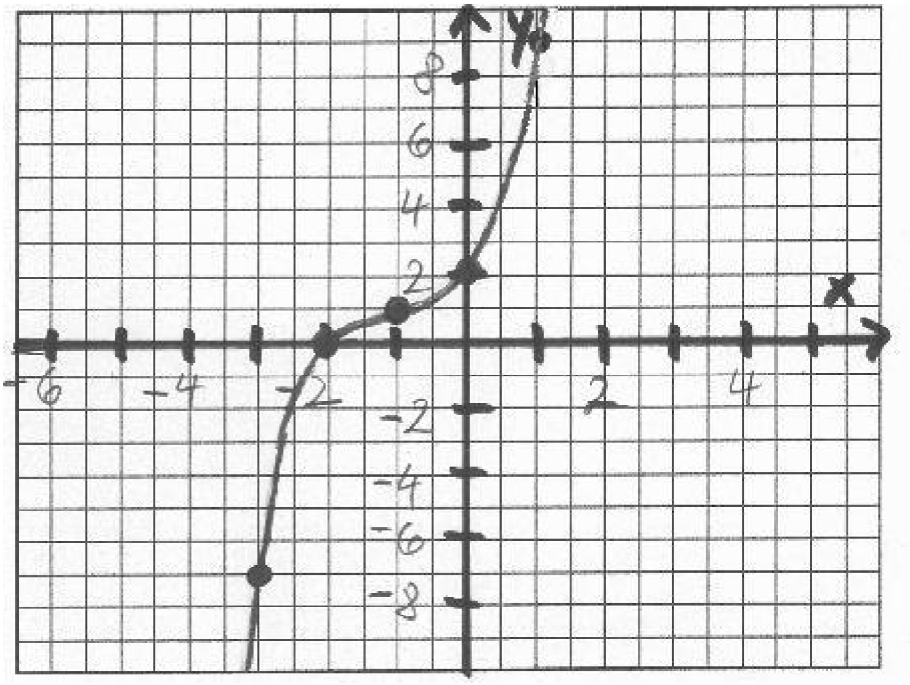
SOLUTIONS

You can find detailed solutions below the link for this problem set!

Problem 1:

- Its domain consists of ***All Real Numbers***.
- The graph of the function changes concavity at ***(-1, 1)***.
- The coordinates of the x-intercept are ***(-2, 0)***.
- The coordinates of the y-intercept are ***(0, 2)***.
- Graph the the function:

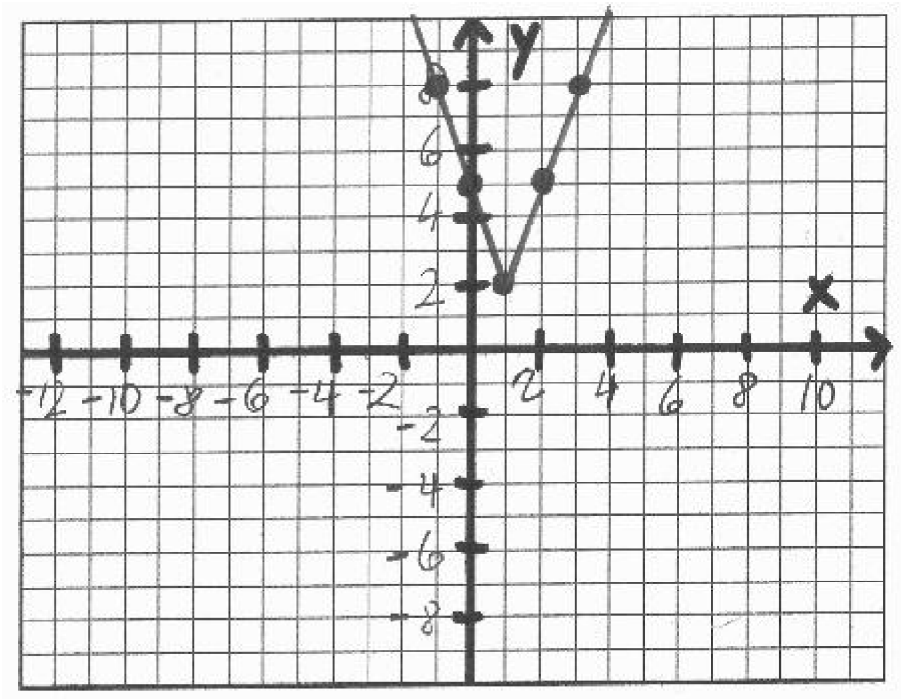
1. **Please note that the graph has SMOOTH curves. It is concave up to the right of the point *(-1, 1)* and concave down to the left of it.**
2. **The graph is NEVER parallel to the y-axis. Instead it moves away from it at a steady pace.**



Problem 2:

- Its domain consists of ***All Real Numbers***.
- The vertex point of the graph is at ***(1, 2)***.
- No x-intercepts.
- The coordinates of the y-intercept are ***(0,5)***.
- Graph of the function:

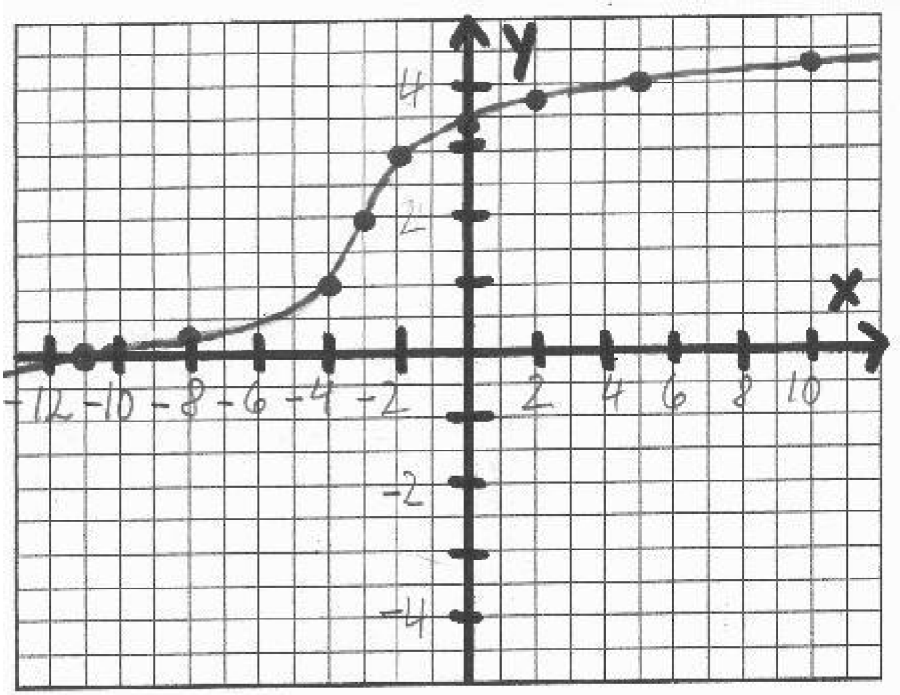
Please observe the V-shaped vertex with straight branches. This vertex is sometimes called a "cusp"!



Problem 3:

- Its domain consists of ***All Real Numbers***.
- The graph of the function changes concavity at ***(-3, 2)***.
- Coordinates of the x-intercept(s):
- The coordinates of the x-intercept are ***(-11, 0)***.
- The coordinates of the y-intercept are approximately ***(0, 3.4)***.
- Graph of the function:

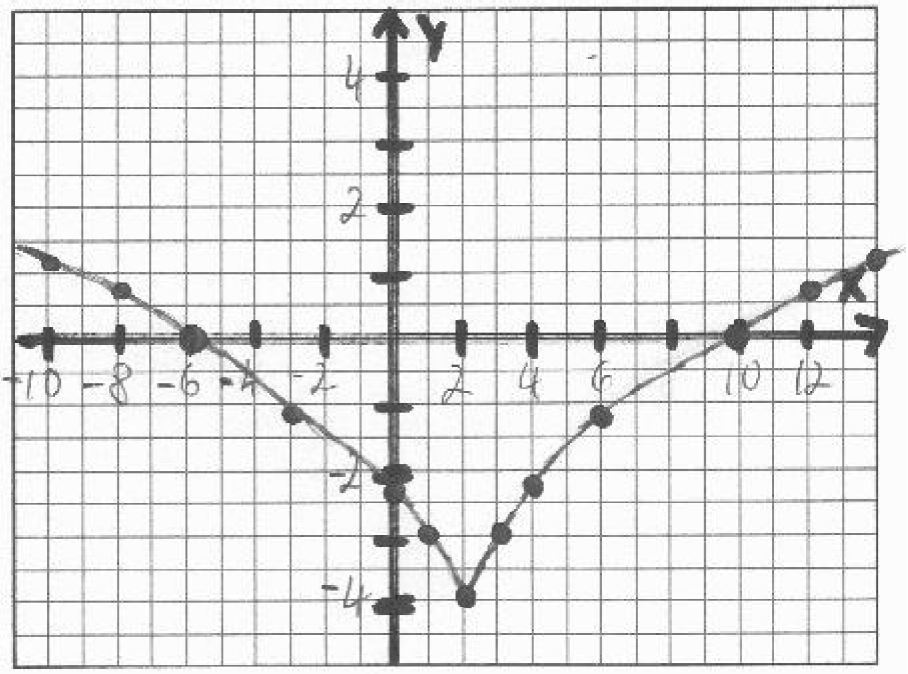
1. **Please note that the graph has SMOOTH curves. It is concave down to the right of the point *(-3, 2)* and concave up to the left of it.**
2. **The graph is NEVER parallel to the x-axis. Instead it moves away from it at a steady pace.**



Problem 4:

- Its domain consists of ***All Real Numbers***.
- The vertex point of the graph of the function is at ***(2, -4)***.
- The coordinates of the x-intercepts are ***(10, 0)*** and ***(-6, 0)***.
- The coordinates of the y-intercept are approximately ***(0, -2.4)***.
- Graph of the function:

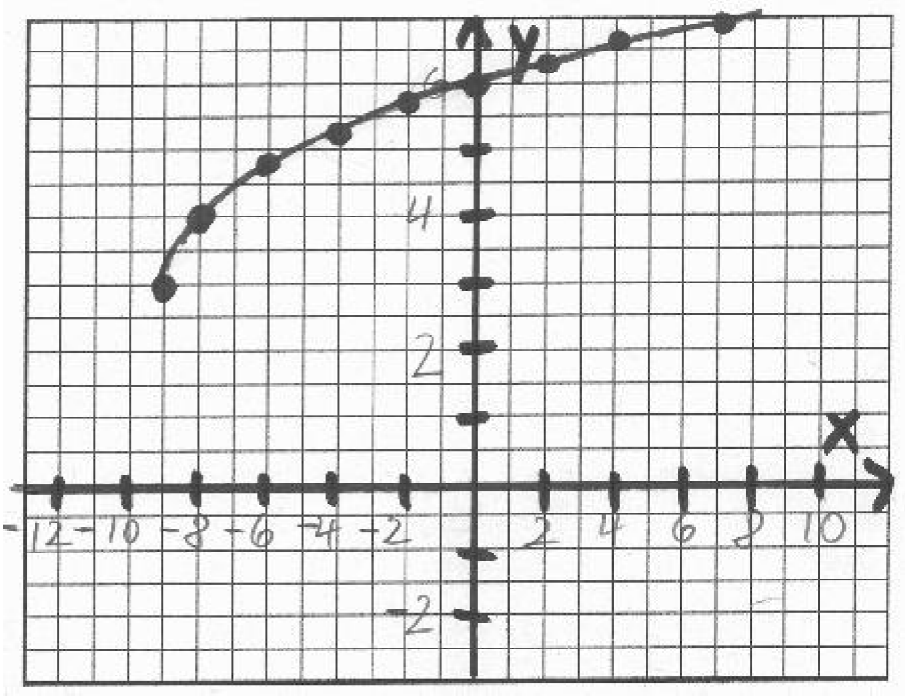
1. **Please observe the V-shaped vertex. Also note that the graph has SMOOTH curves. It is concave down to the right and to the left of the vertex.**
2. **The graph is NEVER parallel to the x-axis. Instead it moves away from it at a steady pace.**



Problem 5:

- Domain is ***[-9, ∞)*** in Interval Notation.
- The graph of this function starts at ***(-9, 3)***.
- No x-intercepts.
- The coordinates of the y-intercept are ***(0, 6)***.
- Graph of the function:

1. **Please note that the graph is a SMOOTH curve. It is concave down to the right of its starting point *(-9, 3)*.**
2. **The graph is NEVER parallel to the x-axis. Instead it moves away from it at a steady pace.**



Problem 6:

- Domain is $(-\infty, 1]$ in Interval Notation.
- The graph of this function starts at ***(1, -2)***.
- The coordinates of the x-intercept are ***(-3, 0)***.
- The coordinates of the y-intercept are ***(0, -1)***.
- Graph of the function:

1. **The graph is concave down to the left of its starting point *(1, -2)*.**
2. **The graph is NEVER parallel to the x-axis. Instead it moves away from it at a steady pace.**