

1. How many solutions are there for the following system of equations?

$$\begin{cases} f(x) = |x-2| + 1 \\ g(x) = \frac{1}{2}x + 3 \end{cases}$$

2. Solve the system of equations in problem 1.
3. How many solutions are there for the following system of equations?

$$\begin{cases} f(x) = x^3 + 4x^2 - 5x - 1 \\ g(x) = \sqrt{2x+3} + 1 \end{cases}$$

4. Solve the system of equations in problem 3.

Use the following for questions 5-10.

A person, riding lawnmower, and a bicycle race down a track. The distance the person travels can be modeled by: $d = 3t$, the distance the mower travels can be modeled by: $d = t^3$, and the distance the bicycle travels can be modeled by: $d = 3^t$

5. Is there ever a 3 way tie? If so, when is it?
6. When are the lawnmower and bicycle tied?
7. When are the person and bicycle tied?
8. When are the lawnmower and person tied?
9. Who goes the farthest after 8 seconds?
10. After 5 seconds, which one's speed is growing the fastest?

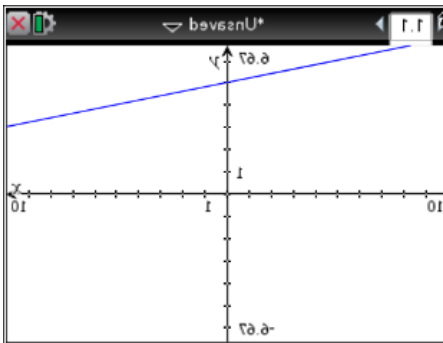
11. If $x \geq 4$ which function is growing faster, $f(x) = 10x$ or $g(x) = x^4$? What if $x \leq 1$?

12. If $x \geq 3$ which function is growing faster, $f(x) = x^3$ or $g(x) = 2^x$? When does $g(x) = 2^x$ start to grow faster than $f(x) = x^3$?

13. What is the y- intercept of each function?

a. $f(x) = 10^x$

b.



c.

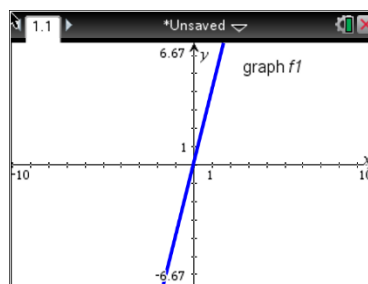
X	Y
-2	3
-1	0
0	-1
1	0
2	3

14. Which has the largest y-intercept?

15. What is the y-intercept of each function?

a. $f(x) = 2x^2 - 3x - 1$

b.



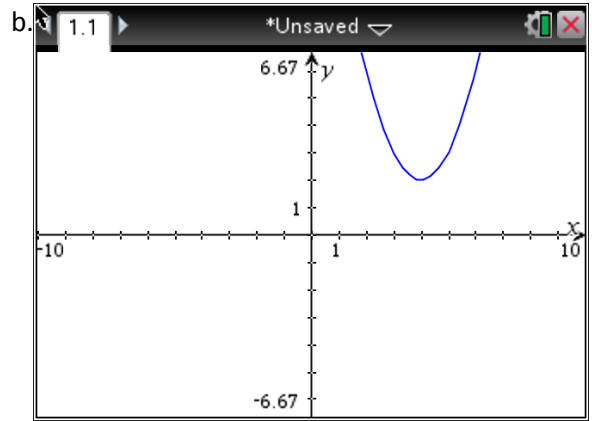
c.

X	Y
-2	0.04
-1	0.2
0	1
1	5
2	25

16. Which has the largest y-intercept?

17. What is the relative minimum of each function?

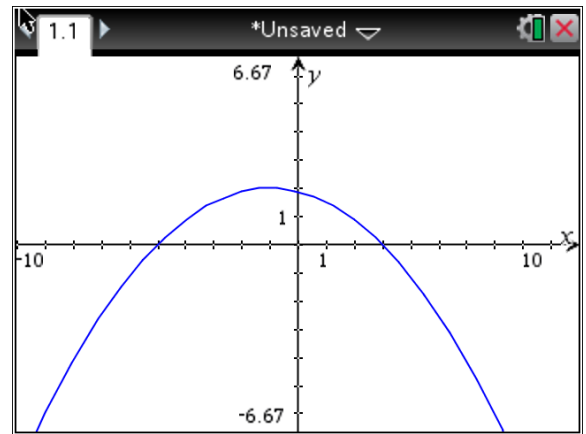
a. $f(x) = |x - 2| + 3$



18. Which function has the largest relative minimum?

19. What is the relative maximum of each function?

a. $f(x) = -2x^2 + 20x - 49$ b.



20. Which function has the largest relative maximum?

State whether the function is exponential, quadratic or linear. Explain your answer.

21. a.

X	Y
-3	1/27
-2	1/9
-1	1/3
0	1
1	3
2	9
3	27

b.

X	Y
-3	11
-2	9
-1	7
0	5
1	3
2	1
3	-1

c.

X	Y
-3	3
-2	0
-1	-1
0	0
1	3
2	8
3	15

22. Two clowns throw pies into the air. The height of the 1st pie can be modeled by $h = -16t^2 + 15t$ where t is the time in seconds, and h is the distance the pie is from the ground in feet. The path of the 2nd clown's pie can be modeled by $h = -16t^2 + 8t + 4$.

a. Are the two pies ever at the same height? If so, when?

b. Which pie is in the air longer?

23. A ball is thrown vertically upward with an initial velocity of 52 ft/s with an initial height of 5 ft from the ground.

a. How high does the ball go?

b. How long is it in the air?