

Solving Polynomial Inequalities Algebraically

Solve the following inequalities. Show your work.

1. $x^2 - 4x - 5 > 0$

2. $2x^2 - 5x - 3 \leq 0$

3. $x(x-2)(x+3) < 0$

4. $(x-2)(2x+5)(3x-10) \geq 0$

5. $x^3 + 6x^2 + 8x \leq 0$

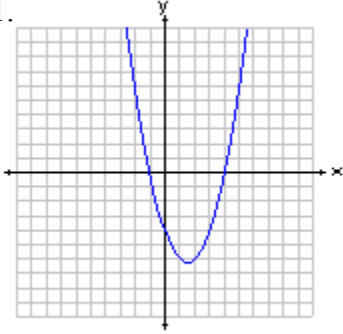
6. $x^3 - 4x^2 > 0$

7. $(x+a)(x-b)(x-c) \leq 0$, where $a, b,$ and c are positive integers such that $a < b < c$.

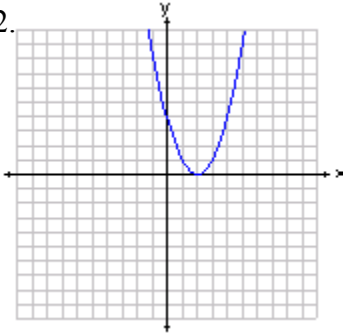
The Discriminant

In the exercises below, the graph of a quadratic function in the form $f(x) = ax^2 + bx + c$ is shown. Tell whether the discriminant is positive, negative, or zero.

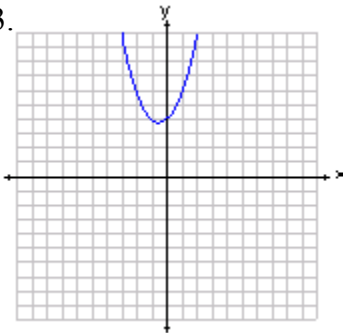
1.



2.

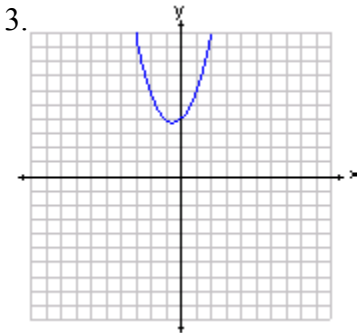
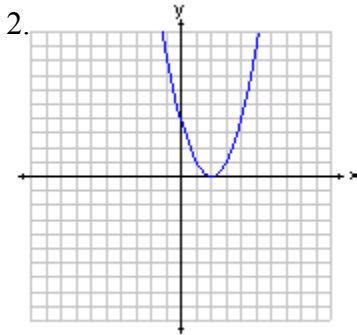
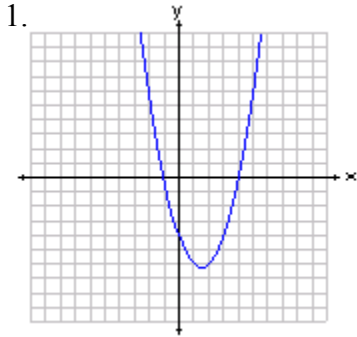


3.



The Discriminant

In the exercises below, the graph of a quadratic function in the form $f(x) = ax^2 + bx + c$ is shown. Tell whether the discriminant is positive, negative, or zero.



Find all values of c for which the equation has (a) two real solutions, (b) one real solution, (c) no real solutions.

4. $x^2 - 2x + c = 0$

5. $x^2 + 12x + c = 0$

Modeling Data With Polynomial Functions

Use finite differences to determine the degree of the polynomial function that fits the data and then use the regression feature on your calculator to find the polynomial function.

1.

x	1	2	3	4	5	6
$f(x)$	4	20	54	112	200	324

2.

x	1	2	3	4	5	6
$f(x)$	8	16	26	38	52	68

3.

x	1	2	3	4	5	6
$f(x)$	73	34	13	-26	-95	-182

4.

x	1	2	3	4	5	6
$f(x)$	48	44	32	6	-40	-112

5.

x	1	2	3	4	5	6
$f(x)$	18	0	32	174	510	1148

6.

x	1	2	3	4	5	6
$f(x)$	-98	-86	-52	16	130	302