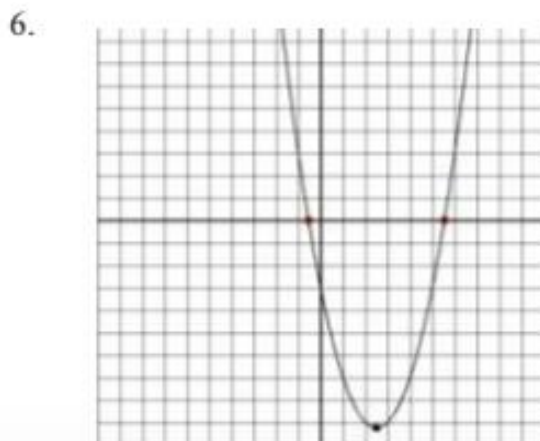
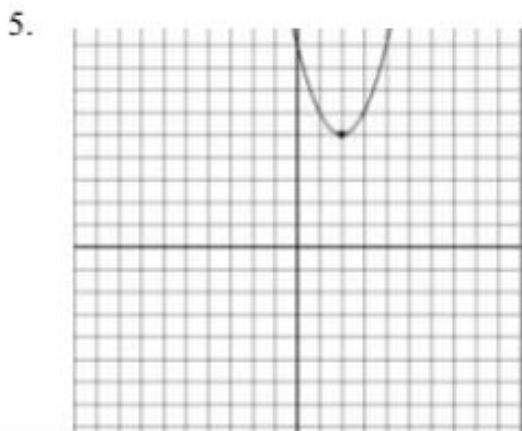
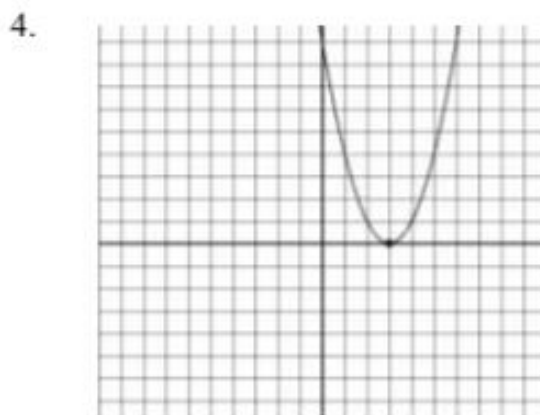
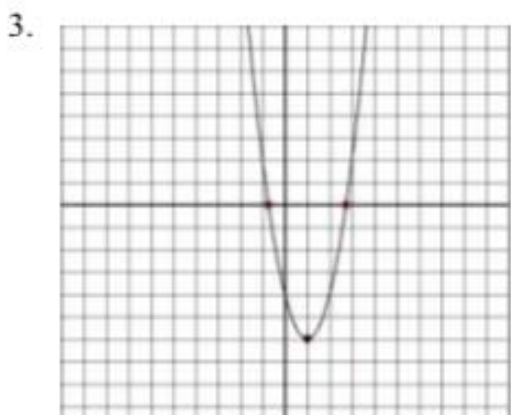
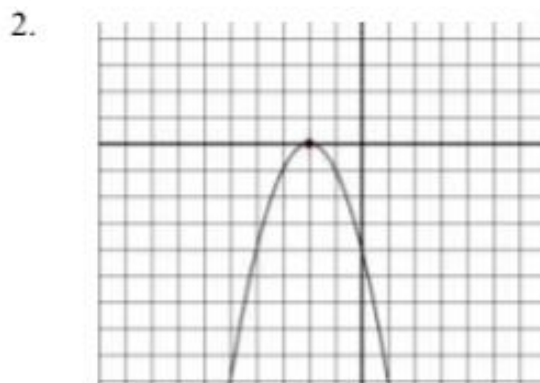
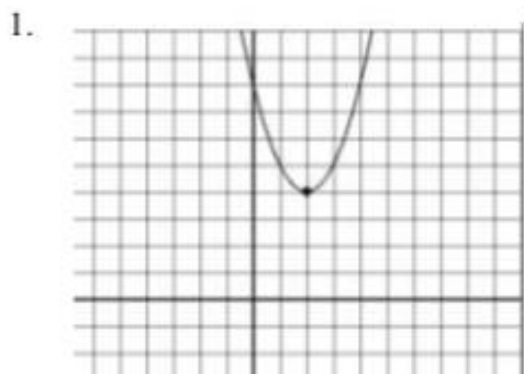


The Discriminant: $b^2 - 4ac$

Given the graphs below determine:

- is the discriminant > 0 , < 0 , or $= 0$
- the number of roots (solutions)
- are the roots real or imaginary



Find the discriminant to determine the number and nature of the roots of the equation.

7. $x^2 + 6x + 4 = 0$

8. $x^2 - 5x - 34 = 0$

9. $2x^2 - 3x + 2 = 0$

10. $3x^2 - 6x + 2 = 0$

11. $3x + 7 = -5x^2 - 4$

12. $-3x^2 + 17x - 2 = 3$

13. $25x^2 - 15x - 64 = 5x - 10$

Find the discriminant to determine the number of x-intercepts of the function.

14. $f(x) = 3x^2 - 4x + 2$

15. $f(x) = -2x^2 + 6x - 8$

16. $f(x) = x^2 - 7x + 7$

17. $f(x) = 9x^2 + 24x + 16$

18. $f(x) = x^2 - 3x + 4$

19. $f(x) = -x^2 - 4$

20. $f(x) = 4x^2 - 28x + 49$

Take it a step further!

21. Find all the values of a such that $ax^2 + 3x + 5 = 0$ has two real roots.

22. Find all the values of a such that $ax^2 + 48x + 64 = 0$ has one real root (a double root).

23. Find all the values of a such that $ax^2 + 3x - 6 = 0$ has two imaginary roots.

24. Find all the values of c such that $2x^2 - 6x + c = 0$ has two imaginary roots.

25. Find all the values of c such $-4x^2 + 8x + c = 0$ that two has real roots.

26. Assuming, $b \neq 0$, does the sign of b affect the value of the discriminant?