

Calculate the discriminant of the quadratic equation $2x^2 + 4x + 5 = 0$.

- A -32
- B -24
- C 48
- D 56

Solve $1 - 2x - 3x^2 > 0$, where x is a real number.

- A $x < -1$ or $x > \frac{1}{3}$
- B $-1 < x < \frac{1}{3}$
- C $x < -\frac{1}{3}$ or $x > 1$
- D $-\frac{1}{3} < x < 1$

Express $2x^2 + 12x + 1$ in the form $a(x + b)^2 + c$. 3

When $x^2 + 8x + 3$ is written in the form $(x + p)^2 + q$, what is the value of q ?

- A -19
- B -13
- C -5
- D 19

What is the solution of $x^2 + 4x > 0$, where x is a real number?

- A $-4 < x < 0$
- B $x < -4, x > 0$
- C $0 < x < 4$
- D $x < 0, x > 4$

The roots of the equation $kx^2 - 3x + 2 = 0$ are equal.

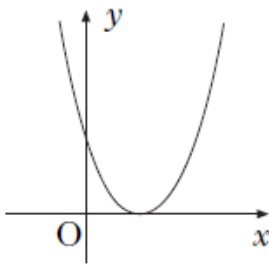
What is the value of k ?

- A $-\frac{9}{8}$
- B $-\frac{8}{9}$
- C $\frac{8}{9}$
- D $\frac{9}{8}$

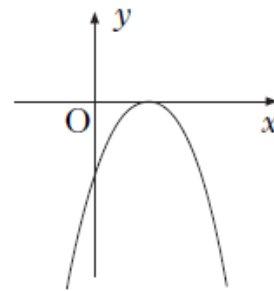
Which of the following diagrams shows a parabola with equation $y = ax^2 + bx + c$, where

- $a > 0$
- $b^2 - 4ac > 0$?

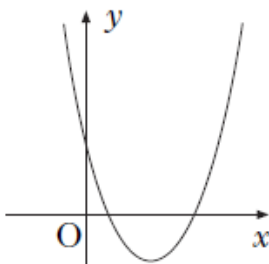
A



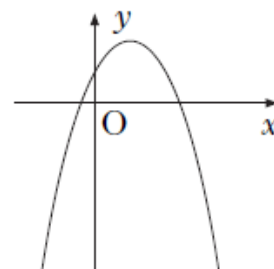
C



B



D



If $f(x) = (x - 3)(x + 5)$, for what values of x is the graph of $y = f(x)$ above the x -axis?

- A $-5 < x < 3$
- B $-3 < x < 5$
- C $x < -5, x > 3$
- D $x < -3, x > 5$

Here are two statements about the roots of the equation $x^2 + x + 1 = 0$:

- (1) the roots are equal;
- (2) the roots are real.

Which of the following is true?

- A Neither statement is correct.
- B Only statement (1) is correct.
- C Only statement (2) is correct.
- D Both statements are correct.

Find the range of values of k such that the equation $kx^2 - x - 1 = 0$ has no real roots.