ALGEBRA EXAMPLE 1

The function *f* defined by $f(x) = -x^2 + 6x - 5$ has

(A) A minimum *y* value and a negative *y*-intercept.
(B) A maximum *y* value and a positive *y*-intercept.
(C) A minimum *y* value and a positive *y*-intercept.
(D) A maximum *y* value and a negative *y*-intercept.

SOLUTION

$$f(x) = -x^2 + 6x - 5$$

Look at the x^2 term. It is negative, so the graph will look like this:

This means that the function has a maximum value.

The intercept occurs where $x = 0$.

$$\therefore f(0) = -(0)^2 + 6(0) - 5 = -5$$

This means that the *y*-intercept is negative.

Now we know that the function has a maximum *y* value and a negative *y*-intercept.

Compare this with options (A), (B), (C) and (D).

The correct answer is D.