

Finding Points of Intersection for Complex Equations - Step-by-Step Lesson

Find the points of intersection for the equations:

$$f(x) = 5x^2 - 14x - 50 \quad \text{and} \quad g(x) = 2x^2 - 8x + 22$$

Explanation:

We have to solve the equations by making them equal to one another. When their value is the same, they will be at the same point (intersect).

$$5x^2 - 14x - 50 = 2x^2 - 8x + 22$$

$$5x^2 - 2x^2 - 14x + 8x - 50 - 22 = 0$$

$$0 = 3x^2 - 6x - 72 = (x - 6)(x + 4)$$

Now we got x value to check: $x = -4$. We put the x value in the equations.

$$f(-4) = 5(-4)^2 - 14(-4) - 50$$

$$= 80 + 56 - 50$$

$$= 86$$

$$g(-4) = 2(-4)^2 - 8(-4) + 22$$

$$= 32 + 32 + 22$$

$$= 86$$

We have $f(-4) = g(-4) = 86$. In other words, we use the value -4 for x, then the value of y is 86 for both equations. So, we will intersect the one point (-4, 86).

$$f(6) = 5(6)^2 - 14(6) - 50 = 46.$$

Hence, the second point of intersection is (6, 46).

