Algebra II Module3

Part 1 of 2

The functions f(x) and g(x) are defined below.

$5-4(-3)^2$
$5-36=-31$

$4-4x^2$
$4-4(-2)^2=4-16$

$f(x)=2-x$
$g(x)=2-x-4x^2$

$g(x)=f(x)=4x^2$

A. Use the functions defined as f(x) and g(x) to complete the table below.

x	f(x)	g(x)
-3	5	-31
-2	4	-12
-1	3	-1
0	2	2
1	1	-3
2	0	-16
3	-1	-37

B. What is the solution?

(0, 2)

Standard page | Answer

MAFS.912.A-REI.4.11

Problem 1

Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, and exponential.

5-3 Practice

$\sqrt{-1} = i$

$\frac{-b \pm \sqrt{b^2-4ac}}{2a}$

Solving Polynomial Equations

Find the real or imaginary solutions of each equation by factoring.

$\sqrt[3]{8x^3} = 2x$, $\sqrt[3]{27} = 3$

$1^3 = 1, 2^3 = 8, 3^3 = 27, 4^3 = 64, 5^3 = 125$

$\sqrt[3]{1} = 1, \sqrt[3]{8} = 2, \sqrt[3]{27} = 3, \sqrt[3]{64} = 4, \sqrt[3]{125} = 5$

1. $8x^3 - 27 = 0$

$(2x-3)(4x^2+6x+9)$

$2x-3=0$

$\frac{2x}{2} = \frac{3}{2}$

$\boxed{x = \frac{3}{2}}$

$\frac{-6 \pm \sqrt{6^2-4(4)(9)}}{2(4)}$

$\frac{-6 \pm \sqrt{36-144}}{8} = \frac{-6 \pm \sqrt{36}\sqrt{3}}{8} = \frac{-6 \pm \sqrt{-108}}{8} = \frac{-6 \pm 6i\sqrt{3}}{8}$

$\boxed{\frac{-3 \pm 3i\sqrt{3}}{4}}$

3. $2x^3 + 54 = 0$

$2(x^3+27)=0$

$\sqrt[3]{x^3}=x$ $\sqrt[3]{27}=3$

$(x+3)(x^2-3x+9)=$

$x+3=0$

$x=-3$

$\frac{3\pm\sqrt{(-3)^2-4(1)(9)}}{2(1)}=\frac{3\pm\sqrt{9-36}}{2}$

$\frac{3\pm\sqrt{-27}}{2}$ $\sqrt{9}\sqrt{3}$

$=\frac{3\pm 3i\sqrt{3}}{2}$

5. $4x^3 - 32 = 0$

$4(x^3 - 8) = 0$

$(x-2)(x^2+2x+4)$

$x-2=0$

$x=2$

$\frac{-2 \pm \sqrt{(2)^2-4(1)(4)}}{2(1)} = \frac{-2 \pm \sqrt{4-16}}{2}$ -

$\frac{-2 \pm \sqrt{-12}}{2} = \frac{-2 \pm 2i\sqrt{3}}{2} = -1 \pm i\sqrt{3}$

$\sqrt{-12} = i\sqrt{4}\sqrt{3} = 2i\sqrt{3}$

7. $64x^3 - 1 = 0$

$(4x - 1)(16x^2 + 4x + 1) = 0$

$4x - 1 = 0$

$\frac{4x}{4} = \frac{1}{4}$

$x = \frac{1}{4}$

$\frac{-4 \pm \sqrt{(4)^2 - 4(16)(1)}}{2(16)}$ $\frac{-4 \pm \sqrt{16 - 64}}{32}$

$\frac{-4 \pm \sqrt{-48}}{32} = \frac{-4 \pm 4i\sqrt{3}}{32} = \frac{-1 \pm i\sqrt{3}}{8}$

$\sqrt{-48} = i\sqrt{16}\sqrt{3} = 4i\sqrt{3}$