Rev 8-12-13

Name _____

Date _____

TI-84+ GC 38 Solving Equations Using Graphs – More Practice

Objectives: Find approximate solutions for equations that we can't solve analytically

Many equations cannot be solved algebraically for exact answers. Sometimes the best we can do is to find approximate solutions.

Method 1: Intersection of graphs: The solution is the x-coordinate of the point of intersection, found by: 2nd TRACE (CALC), option 5 (intersection), 1st curve (enter), 2nd curve (enter), guess (enter).. Repeat, if necessary, for a second solution, making the Guess closer to the desired intersection.

Method 2: X-intercept : You may need to change the window to zoom in on the solution. The solution is the x-coordinate of the x-intercept, found by: 2nd TRACE (CALC), option 2 (zero); left bound (enter), right bound, (enter), guess, (enter). Repeat, if necessary, for a second solution.

Use a graphing calculator to approximate the solutions to these equations to the nearest ten-thousandth. For each equation answer the following: What function(s) did you graph? Briefly describe the location of the solution on your graph. (Hint: Do not try to solve these by hand!)

1) $2^x = -x^3 + 5$

2) $\sqrt[4]{x} - \pi = -x^4 + 3$

3) $-0.02x^5 + 6 = 2 + \sqrt{x}$

4) $\sqrt[3]{x} - 4 = -x^3 + 2$

5) $\ln(x) + 4 = e^{x-3}$ (Hint: 2 solutions)

6) $0.02\left(3^x\right) = -0.1x^4 + 6$ (Hint: 2 solutions)

7) $\pi x^5 - 3 = \sqrt[5]{x} + 6$

8) $\log(x+4) = -x^3 + 2$

9) $0.1x^4 = 6\sqrt[3]{x}$ (Hint: 2 solutions)

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TI-84+ GC 38 Solving Equations Using Graphs – More Practice solutions

1) Method 1: Intersection of graphs

$y_1 = 2^x$

$y_2 = -x^3 + 5$

Method 2: X-intercept

$y_1 = 2^x + x^3 - 5$

By either method, the solution is $x \approx 1.3487$

2) Method 1: Intersection of graphs

$y_1 = \sqrt[4]{x} - \pi$ (Close the parentheses before subtracting pi.)

$y_2 = -x^4 + 3$

Method 2: X-intercept

$y_1 = \sqrt[4]{x} - \pi + x^4 - 3$

By either method, the solution is $x \approx 1.4980$

3) Method 1: Intersection of graphs

$y_1 = -0.02x^5 + 6$

$y_2 = 2 + \sqrt{x}$

Method 2: X-intercept

$y_1 = -0.02x^5 + 6 - 2 - \sqrt{x}$ (or simplified)

By either method, the solution is $x \approx 2.6023$

4) Method 1: Intersection of graphs

$y_1 = \sqrt[3]{x} - 4$ (Close the parentheses before subtracting 4.)

$y_2 = -x^3 + 2$

Method 2: X-intercept

$y_1 = \sqrt[3]{x} - 4 + x^3 - 2$ (or simplified)

By either method, the solution is $x \approx 1.6880$

5) Method 1: Intersection of graphs

$y_1 = \ln x + 4$ (Close the parentheses before adding 4.)

$y_2 = e^{x-3}$

Method 2: X-intercept

$y_1 = \ln x + 4 - e^{x-3}$

By either method, the solutions are $x \approx 0.0193$ and $x \approx 4.7139$

6) Method 1: Intersection of graphs

$y_1 = 0.02(3^x)$

$y_2 = -0.1x^4 + 6$

Method 2: X-intercept

$y_1 = 0.02(3^x) + 0.1x^4 - 6$

By either method, the solutions are $x \approx -2.7830$ and $x \approx 2.7351$

7) Method 1: Intersection of graphs

$y_1 = \pi x^5 - 3$

$y_2 = \sqrt[5]{x} + 6$ (Close the parentheses before adding 6.)

Method 2: X-intercept

$y_1 = \pi x^5 - 3 - \sqrt[5]{x} - 6$ (or simplified)

By either method, the solution is $x \approx 1.2618$

8) Method 1: Intersection of graphs

$y_1 = \pi x^5 - 3$

$y_2 = -x^3 + 2$

Method 2: X-intercept

$y_1 = \pi x^5 - 3 + x^3 - 2$ (or simplified)

By either method, the solution is $x \approx 1.0895$

9) Method 1: Intersection of graphs

$y_1 = 0.1x^4$

$y_2 = 6\sqrt[3]{x}$

Method 2: X-intercept

$y_1 = 0.1x^4 - 6\sqrt[3]{x}$

By either method, the solutions are $x = 0$ and $x \approx 3.0546$