

Section 5 – Topic 9
Systems of Equations with Quadratic Equations – Part 2

Let's Practice!

1. Consider the following system.

$$\begin{cases} f(x) = 2x - 3 \\ g(x) = x^2 - 4x - 5 \end{cases}$$

The following table represents the system. Use successive approximations to find the x -coordinate of the negative solution to the nearest tenth.

x	$f(x)$	$g(x)$
-3	-9	16
-2	-7	7
-1	-5	0
0	-3	-5
1	-1	-8
2	1	-9

$x = -0.3$

-0.1 ± -0.9

Handwritten calculations for successive approximations:

$2(-1) - 3 = -2 - 3 = -3.2$
 $(-1)^2 - 4(-1) - 5 = 0.1 + 4 - 5 = -4.59$
 Difference: 1.39

$2(-2) - 3 = -4 - 3 = -3.4$
 $(-2)^2 - 4(-2) - 5 = 0.4 + 8 - 5 = -4.16$
 Difference: $.76$

$2(-3) - 3 = -6 - 3 = -3.6$
 $(-3)^2 - 4(-3) - 5 = 0.9 + 12 - 5 = -3.71$
 Difference: $.11$

$2(-4) - 3 = -8 - 3 = -3.8$
 $(-4)^2 - 4(-4) - 5 = 1.6 + 16 - 5 = 3.28$
 Difference: $.52$

Vertical list of differences: 2.5, 1.4, 5, 2, 7, 10

BEAT THE TEST

1. Quadratics Circus is in town. Two of their best performers decide to do the Human Cannonball act from opposite sides of the stage and high-five in the air. The height above the stage $h(t)$ at any time t , in seconds, for both performers is given by the following system:

$$h(t)_1 = -5(t - 1)^2 + 5$$

$$h(t)_2 = -5(t - 2)^2 + 5$$

At what height do the performers high-five?

3.75 meters.

$$-5(1.5-1)^2 + 5$$

$$-5(0.5)^2 + 5$$

$$-5(0.25) + 5$$

$$-1.25 + 5 = 3.75$$

$$\frac{-5(t-1)^2 + 5}{-5} = \frac{-5(t-2)^2 + 5}{-5}$$

$$t^2 - 2t + 1 = t^2 - 4t + 4$$

$$+4t = +4$$

$$2t = 3$$

$$\frac{2t}{2} = \frac{3}{2} \quad t = 1.5 \text{ seconds}$$