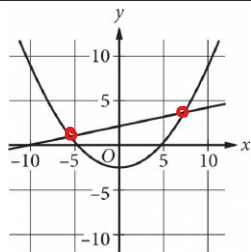


Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	■ ■ □

ID: a5663025

2.1



A system of equations consists of a quadratic equation and a linear equation. The equations in this system are graphed in the xy -plane above. How many solutions does this system have?

- A. 0
- B. 1
- ~~C. 2~~
- D. 3

Question ID d0a7871e

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	

ID: d0a7871e

2.2

$$y = x + 1$$

$$y = x^2 + x$$

If (x, y) is a solution to the system of equations above, which of the following could be the value of x ?

~~A.~~ -1

B. 0

C. 2

D. 3

Desmos $\rightarrow$ $(-1, 0), (1, 2)$
//

Question ID 7f81d0c3

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	■ ■ □

ID: 7f81d0c3

$$x^2 - x - 1 = 0$$

What values satisfy the equation above?

A. $x = 1$ and $x = 2$

B. $x = -\frac{1}{2}$ and $x = \frac{3}{2}$

~~C. $x = \frac{1+\sqrt{5}}{2}$ and $x = \frac{1-\sqrt{5}}{2}$~~

D. $x = \frac{-1+\sqrt{5}}{2}$ and $x = \frac{-1-\sqrt{5}}{2}$

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

2.3

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

$$= \frac{1 + \sqrt{5}}{2} \quad , \quad \frac{1 - \sqrt{5}}{2}$$

// //

Question ID 911383f2

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	

ID: 911383f2

2.4

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

What is the product of the solutions to the given equation?

- A. 8
- B. 3
- C. -3
- ☒ D. -8

$$x = 4, -2, 1$$
$$\text{Product} = -8 //$$

Question ID b80d10d7

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	■ ■ □

ID: b80d10d7

2.5

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

What is the solution to the equation above?

- A. 0
- ~~B. 2~~
- C. 3
- D. 5

แทนค่า หรือ Desmos
หรือแก้เอง

$$2(x+1) = (x+5) - 1$$

$$2x+2 = x+5-1$$

$$x = 2 //$$

Question ID fcdf87b7

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	

ID: fcdf87b7

2.6

$$y = x^2 - 4x + 4$$
$$y = 4 - x$$

If the ordered pair (x, y) satisfies the system of equations above, what is one possible value of x ?

Desmos → $(0, 4)$, $(3, 1)$
 // //

Question ID 652054da

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	

ID: 652054da

2.7

An oceanographer uses the equation $s = \frac{3}{2}p$ to model the speed s , in knots, of an ocean wave, where p represents the period of the wave, in seconds. Which of the following represents the period of the wave in terms of the speed of the wave?

~~A.~~ $p = \frac{2}{3}s$

B. $p = \frac{3}{2}s$

C. $p = \frac{2}{3} + s$

D. $p = \frac{3}{2} + s$

$$p = \frac{2s}{3} //$$

Question ID 6e02cd78

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	■ ■ □

ID: 6e02cd78

2.8

In the xy -plane, what is the y -coordinate of the point of intersection of the graphs of $y = (x - 1)^2$ and $y = 2x - 3$?

Desmos $\rightarrow$ $(2, 1)$

Question ID 802549ac

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	

ID: 802549ac

2.9

$$(x+2)(x+3) = (x-2)(x-3) + 10$$

Which of the following is a solution to the given equation?

~~A. 1~~

B. 0

C. -2

D. -5

Desmos $\rightarrow$ (1, 12)
//

Question ID a4f61d75

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	

ID: a4f61d75

2.10

$x^2 - ax + 12 = 0$

In the equation above, a is a constant and a > 0. If the equation has two integer solutions, what is a possible value of a?

+ + 9 ไม้ได้
ทำให้ a < 0
(ผิดเงื่อนไข)

$(x + 4)(x + 3) \rightarrow a = -7$
 $(x - 4)(x - 3) \rightarrow a = 7 //$
 $(x - 6)(x - 2) \rightarrow a = 8 //$
 $(x - 12)(x - 1) \rightarrow a = 13 //$

Question ID 630897df

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	■ ■ □

ID: 630897df

2.11

The speed of sound in dry air, v , can be modeled by the formula $v = 331.3 + 0.606T$, where T is the temperature in degrees Celsius and v is measured in meters per second. Which of the following correctly expresses T in terms of v ?

- A. $T = \frac{v + 0.606}{331.3}$
- B. $T = \frac{v - 0.606}{331.3}$
- C. $T = \frac{v + 331.3}{0.606}$
- ~~D.~~ $T = \frac{v - 331.3}{0.606}$

$$T = \frac{v - 331.3}{0.606} //$$

Question ID c77ef2fb

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	

ID: c77ef2fb

2.12

Blood volume, V_B , in a human can be determined using the equation

$V_B = \frac{V_P}{1-H}$, where V_P is the plasma volume and H is the hematocrit (the

fraction of blood volume that is red blood cells). Which of the following correctly expresses the hematocrit in terms of the blood volume and the plasma volume?

~~A.~~ $H = 1 - \frac{V_P}{V_B}$

B. $H = \frac{V_B}{V_P}$

C. $H = 1 + \frac{V_B}{V_P}$

D. $H = V_B - V_P$

$$\begin{aligned}
 V_B - V_B H &= V_P \\
 H &= \frac{V_P - V_B}{V_B} \\
 &= 1 - \frac{V_P}{V_B} //
 \end{aligned}$$

Question ID 364a2d25

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	

ID: 364a2d25

2.13

$x + y = 17$

$xy = 72$

If one solution to the system of equations above is (x,y) ,
what is one possible value of x ?

Desmos → $(\underline{8}, 9), (9, \underline{8})$

Question ID 0980fcdd

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	■ ■ □

ID: 0980fcdd

2.14

$$\begin{aligned}x^2 &= 6x + y \\ y &= -6x + 36\end{aligned}$$

A solution to the given system of equations is (x, y) . Which of the following is a possible value of xy ?

- ☒ A. 0
- ☐ B. 6
- ☐ C. 12
- ☐ D. 36

Desmos $\rightarrow (6, 0), (-6, 72)$

$$\begin{aligned}xy &= 6(0) = 0 // \\ &= -6(72) = -432 //\end{aligned}$$

Question ID 87a3de81

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	

ID: 87a3de81

2.15

$$x^2 + x - 12 = 0$$

If a is a solution of the equation above and $a > 0$, what is the value of a ?

Desmos $\rightarrow x = \cancel{-4}, 3 //$

un factor $(x + 4)(x - 3) = 0$

$x = \cancel{-4}, 3 //$

Question ID 2683b5db

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	■ ■ □

ID: 2683b5db

2.16

$$T = 0.01(P - 40,000)$$

In a city, the property tax T , in dollars, is calculated using the formula above, where P is the value of the property, in dollars. Which of the following expresses the value of the property in terms of the property tax?

A. $P = 100T - 400$

B. $P = 100T + 400$

C. $P = 100T - 40,000$

~~D. $P = 100T + 40,000$~~

$$\begin{aligned}
 P &= \frac{T}{0.01} + 40,000 \\
 &= 100T + 40,000 //
 \end{aligned}$$

Question ID 2f958af9

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	■ ■ □

ID: 2f958af9

2.17

$$v^2 = \frac{LT}{m}$$

The formula above expresses the square of the speed v of a wave moving along a string in terms of tension T , mass m , and length L of the string.

What is T in terms of m , v , and L ?

~~A. $T = \frac{mv^2}{L}$~~

B. $T = \frac{m}{v^2 L}$

C. $T = \frac{mL}{v^2}$

D. $T = \frac{L}{mv^2}$

$$T = \frac{v^2 m}{L} //$$

Question ID 876a731c

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	

ID: 876a731c

2.18

$$y = x^2$$

$$2y + 6 = 2(x + 3)$$

If (x, y) is a solution of the system of equations above and $x > 0$, what is the value of xy ?

- ☒ A. 1
- ☐ B. 2
- ☐ C. 3
- ☐ D. 9

Desmos $\rightarrow (1, 1), (\cancel{0}, 0)$

$$xy = 1(1) = 1 //$$

Question ID 928498f3

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	■ ■ □

ID: 928498f3

2.19

$$6x^2 + 5x - 7 = 0$$

~
ตัดไข้อย

What are the solutions to the given equation?

~~A.~~ $\frac{-5 \pm \sqrt{25 + 168}}{12}$

B. $\frac{-6 \pm \sqrt{25 + 168}}{12}$

C. $\frac{-5 \pm \sqrt{36 - 168}}{12}$

D. $\frac{-6 \pm \sqrt{36 - 168}}{12}$

$$\begin{aligned} & -5 \pm \sqrt{5^2 - 4(6)(-7)} \\ & \quad \quad \quad 2(6) \\ & = \frac{-5 \pm \sqrt{25 + 168}}{12} // \end{aligned}$$

Question ID 2d2ab76b

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	

ID: 2d2ab76b

2.20

$$y = x^2 - 1$$

$$y = 3$$

When the equations above are graphed in the xy -plane, what are the coordinates (x, y) of the points of intersection of the two graphs?

- ~~A. $(2, 3)$~~
and $(-2, 3)$
- B. ~~$(2, 0)$~~
and $(-2, 0)$
- C. ~~$(3, 8)$~~
and $(-3, 8)$
- D. ~~$(\sqrt{2}, 3)$~~
and $(-\sqrt{2}, 3)$

$$3 = x^2 - 1$$

$$x = 2, -2$$

$$(2, 3), (-2, 3) //$$

Desmos $\rightarrow (2, 3), (-2, 3)$
 $// \quad //$

Question ID 3b4b8831

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	■ ■ □

ID: 3b4b8831

2.21

$$38x^2 = 38(9)$$

What is the negative solution to the given equation?

$$x^2 = 9$$

$$x = \cancel{3}, -3$$

//

Question ID f5247e52

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	■ ■ □

ID: f5247e52

2.22

$$y = ax^2 - c$$

In the equation above, a and c are positive constants. How many times does the graph of the equation above intersect the graph of the equation

$y = a + c$ in the xy -plane?

- A. Zero
- B. One
- ☒ C. Two
- D. More than two

ลองแทนค่า $a = 2$ / $c = 3$
Desmos → 2 จุดตัด

Question ID f76c1858

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	

ID: f76c1858

2.23

$7x^2 - 20x - 32 = 0$ What is the positive solution to the given equation?

Desmos $\rightarrow (-1.\overset{\overset{-\frac{8}{7}}{\nearrow}}{14286}, 0), (\underline{\underline{4}}, 0)$
X

Question ID 4e18fc5d

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Advanced Math	Nonlinear equations in one variable and systems of equations in two variables	

ID: 4e18fc5d

2.24

$v = -\frac{w}{150x}$

The given equation relates the distinct positive numbers v , w , and x . Which equation correctly expresses w in terms of v and x ?

~~A.~~ $w = -150vx$

B. $w = -\frac{150v}{x}$

C. $w = -\frac{x}{150v}$

D. $w = v + 150x$

$$V = \frac{W}{-150x}$$
$$W = -150xV //$$