Question ID fc3d783a

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

ID: fc3d783a

3.1

In the xy-plane, a line with equation $2y = 4.5$ intersects a parabola at exactly one point. If the parabola has equation $y = -4x^2 + bx$, where b is a positive constant, what is the value of b?

Question ID 4661e2a9

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

ID: 4661e2a9

3.2

$x - y = 1$

$x + y = x^2 - 3$

Which ordered pair is a solution to the system of equations above?

A. $(1+\sqrt{3}, \sqrt{3})$

B. $(\sqrt{3}, -\sqrt{3})$

C. $(1+\sqrt{5}, \sqrt{5})$

D. $(\sqrt{5}, -1+\sqrt{5})$

Question ID f65288e8

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

ID: f65288e8

3.3

$$\frac{1}{x^2+10x+25}=4$$

If x is a solution to the given equation, which of the following is a possible value of $x+5$?

A. $\frac{1}{2}$

B. $\frac{5}{2}$

C. $\frac{9}{2}$

D. $\frac{11}{2}$

Question ID f2f3fa00

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

ID: f2f3fa00

3.4

During a 5-second time interval, the average acceleration a, in meters per second squared, of an object with an initial velocity of 12 meters per second is defined by the equation $a = \frac{v_f - 12}{5}$, where v_f is the final velocity of the object in meters per second. If the equation is rewritten in the form $v_f = xa + y$, where x and y are constants, what is the value of x ?

Question ID 6ce95fc8

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

ID: 6ce95fc8

3.5

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

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

A. 2

B. $1 - \sqrt{11}$

C. $\frac{1}{2} + \sqrt{11}$

D. $\frac{1 + \sqrt{11}}{2}$

Question ID c303ad23

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

ID: c303ad23

3.6

If $3x^2 - 18x - 15 = 0$, what is the value of $x^2 - 6x$?

Question ID 7bd10ef3

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

ID: 7bd10ef3

3.7

$2x^2 - 4x = t$

In the equation above, t is a constant. If the equation has no real solutions, which of the following could be the value of t ?

A. -3

B. -1

C. 1

D. 3

Question ID 66bce0c1

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

ID: 66bce0c1

3.8

$\sqrt{2x+6}+4=x+3$

What is the solution set of the equation above?

A. $\{-1\}$

B. $\{5\}$

C. $\{-1, 5\}$

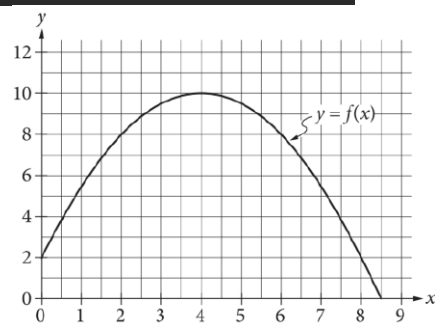
D. $\{0, -1, 5\}$

Question ID 97e50fa2

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

ID: 97e50fa2

3.9



The graph of the function *f*, defined by $f(x) = -\frac{1}{2}(x-4)^2+10$, is shown in the *xy*-plane above. If the function *g* (not shown) is defined by $g(x) = -x+10$, what is one possible value of *a* such that $f(a) = g(a)$?

Question ID 3d12b1e0

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

ID: 3d12b1e0

3.10

$$-16x^2 - 8x + c = 0$$

In the given equation, c is a constant. The equation has exactly one solution. What is the value of c?

Question ID 71014fb1

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

ID: 71014fb1

3.11

$$(x-1)^2 = -4$$

How many distinct real solutions does the given equation have?

A. Exactly one

B. Exactly two

C. Infinitely many

D. Zero

Question ID e9349667

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

ID: e9349667

3.12

$y = x^2 + 2x + 1$

$x + y + 1 = 0$

If (x_1, y_1) and (x_2, y_2) are the two solutions to the system of equations above, what is the value of $y_1 + y_2$?

A. -3

B. -2

C. -1

D. 1

Question ID b03adde3

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

ID: b03adde3

3.13

If $u-3=\frac{6}{t-2}$, what is t in terms of u?

A. $t=\frac{1}{u}$

B. $t=\frac{2u+9}{u}$

C. $t=\frac{1}{u-3}$

D. $t=\frac{2u}{u-3}$

Question ID 30281058

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

ID: 30281058

3.14

In the *xy*-plane, the graph of $y = x^2 - 9$ intersects line *p* at $(1, a)$ and $(5, b)$, where *a* and *b* are constants. What is the slope of line *p* ?

A. 6

B. 2

C. -2

D. -6

Question ID 5910bfff

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

ID: 5910bfff

3.15

$$D = T - \frac{9}{25}(100 - H)$$

The formula above can be used to approximate the dew point D, in degrees Fahrenheit, given the temperature T, in degrees Fahrenheit, and the relative humidity of H percent, where $H > 50$. Which of the following expresses the relative humidity in terms of the temperature and the dew point?

A. $H = \frac{25}{9}(D - T) + 100$

B. $H = \frac{25}{9}(D - T) - 100$

C. $H = \frac{25}{9}(D + T) + 100$

D. $H = \frac{25}{9}(D + T) - 100$

Question ID 1697ffcf

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

ID: 1697ffcf

3.16

In the *xy*-plane, the graph of $y = 3x^2 - 14x$ intersects the graph of $y = x$ at the points $(0, 0)$ and (a, a). What is the value of *a* ?

Question ID ff2e5c76

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

ID: ff2e5c76

3.17

$$x^2 - 40x - 10 = 0$$

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

A. 0

B. 5

C. 10

D. 40

Question ID 2c5c22d0

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

ID: 2c5c22d0

3.18

$y = x^2 + 3x - 7$

$y - 5x + 8 = 0$

How many solutions are there to the system of equations above?

A. There are exactly 4 solutions.

B. There are exactly 2 solutions.

C. There is exactly 1 solution.

D. There are no solutions.

Question ID fc3dfa26

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

ID: fc3dfa26

3.19

$$\frac{4x^2}{x^2-9}-\frac{2x}{x+3}=\frac{1}{x-3}$$

What value of x satisfies the equation above?

A. -3

B. $-\frac{1}{2}$

C. $\frac{1}{2}$

D. 3

Question ID 58b109d4

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

ID: 58b109d4

3.20

$$x^2 + y + 7 = 7$$
$$20x + 100 - y = 0$$

The solution to the given system of equations is (x, y). What is the value of x?

Question ID 7028c74f

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

ID: 7028c74f

3.21

$5(x+7)=15(x-17)(x+7)$ What is the sum of the solutions to the given equation?

Question ID e11294f9

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

ID: e11294f9

3.22

The solutions to $x^2 + 6x + 7 = 0$ are r and s, where $r < s$. The solutions to $x^2 + 8x + 8 = 0$ are t and u, where $t < u$. The solutions to $x^2 + 14x + c = 0$, where c is a constant, are $r + t$ and $s + u$. What is the value of c?