Question ID a5663025

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

2.1
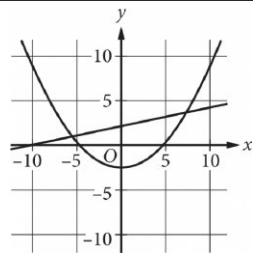
A system of equations consists of a quadratic equation and a linear equation. The equations in this system are graphed in the *xy*-plane above. How many solutions does this system have?

A. 0

B. 1

C. 2

D. 3

Question ID d0a7871e

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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

Question ID 7f81d0c3

Assessment	Test	Domain	Skill	Difficulty
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2.3

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

What values satisfy the equation above?

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

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

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

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

Question ID 911383f2

Assessment	Test	Domain	Skill	Difficulty
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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

Question ID b80d10d7

Assessment	Test	Domain	Skill	Difficulty
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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

Question ID fcdf87b7

Assessment	Test	Domain	Skill	Difficulty
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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 ?

Question ID 652054da

Assessment	Test	Domain	Skill	Difficulty
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2.7

An oceanographer uses the equation $s = \dfrac{3}{2}p$ 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. $p = \dfrac{2}{3}s$

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

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

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

Question ID 6e02cd78

Assessment	Test	Domain	Skill	Difficulty
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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 $y=2x-3$?

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

Question ID a4f61d75

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

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 ?

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. $T = \dfrac{v + 0.606}{331.3}$

B. $T = \dfrac{v - 0.606}{331.3}$

C. $T = \dfrac{v + 331.3}{0.606}$

D. $T = \dfrac{v - 331.3}{0.606}$

Question ID c77ef2fb

Assessment	Test	Domain	Skill	Difficulty
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2.12

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

$V_B = \dfrac{V_P}{1-H}$, 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. $H = 1 - \dfrac{V_P}{V_B}$

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

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

D. $H = V_B - V_P$

Question ID 364a2d25

Assessment	Test	Domain	Skill	Difficulty
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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 ?

Question ID 0980fcdd

Assessment	Test	Domain	Skill	Difficulty
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2.14

$$x^2 = 6x + y$$
$$y = -6x + 36$$

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

Question ID 87a3de81

Assessment	Test	Domain	Skill	Difficulty
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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 ?

Question ID 2683b5db

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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. $P = 100T + 40{,}000$

Question ID 2f958af9

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

Question ID 876a731c

Assessment	Test	Domain	Skill	Difficulty
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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

Question ID 928498f3

Assessment	Test	Domain	Skill	Difficulty
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2.19

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

What are the solutions to the given equation?

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

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

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

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

Question ID 2d2ab76b

Assessment	Test	Domain	Skill	Difficulty
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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. $(2,4)$
and $(-2,4)$

C. $(3,8)$
and $(-3,8)$

D. $(\sqrt{2},3)$
and $(-\sqrt{2},3)$

Question ID 3b4b8831

Assessment	Test	Domain	Skill	Difficulty
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2.21

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

What is the negative solution to the given equation?

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

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?

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. $w = v + 150x$