

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 ?

Desmos → เลือก b

$$b = 6, \text{ } \cancel{-6}$$

วิธีจริง จักรูป $b^2 - 4ac = 0$
เสียเวลา

Question ID 4661e2a9

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

Desmos → $(2.73, 1.73), (-0.73, 1.73)$

ลืมจิมเครื่องคิดเลขแต่ละข้อย

แทนค่า

✓
แก้เอง

Question ID f65288e8

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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. $\frac{11}{2}$

Desmos $\rightarrow (-5.5, 4), (-4.5, 4)$

$x + 5 = -0.5, 0.5$
 $// \quad //$

Question ID f2f3fa00

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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 ?

$$V_f = 5a + 12$$

$$x = 5 //$$

Question ID 6ce95fc8

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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. $\frac{1}{2} + \sqrt{11}$ ✗

✗ $\frac{1 + \sqrt{11}}{2}$

Desmos $\rightarrow x = \underline{2.15}, \underline{-1.15}$

Question ID c303ad23

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ID: c303ad23

3.6

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

Desmos ໑໒໓໔໕໖໗໘໙໐

$$3x^2 - 18x = 15$$

$$3(x^2 - 6x) = 15$$

$$x^2 - 6x = 5 //$$

Question ID 7bd10ef3

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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

Desmos → ตอบ A.
แทนค่าไป

Question ID 66bce0c1

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

Desmos $\rightarrow x = 5$

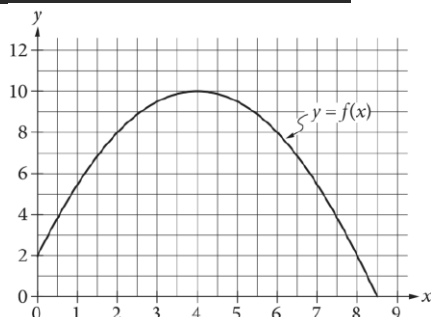
แทนค่า $x = -1$ และตัดไขว้

Question ID 97e50fa2

Assessment	Test	Domain	Skill	Difficulty
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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 $f(a) = g(a)$?

17 X

Desmos $\rightarrow$ (2, 8), (8, 2)

Question ID 3d12b1e0

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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 ?

Desmos ^{ti}now $C \rightarrow C = -1 //$

Question ID 71014fb1

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ID: 71014fb1

3.11

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

How many distinct real solutions does the given equation have?

ยกกำลัง 2 → 0, +

- A. Exactly one
- B. Exactly two
- C. Infinitely many
- ☒ D. Zero

$$|x - 1| = -4$$

Desmos

Question ID e9349667

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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

Desmos $\rightarrow (-2, \underline{1}), (-1, \underline{0})$

Sum of $y = 1 + 0$
 $= 1$
 $//$

Question ID b03adde3

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

$$(u-3)(t-2) = 6$$

$$t = \frac{6}{u-3} + 2$$

$$= \frac{6 + 2(u-3)}{u-3}$$

$$= \frac{2u}{u-3} //$$

Question ID 30281058

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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

$$x = 1 \rightarrow y = 1^2 - 9$$

$$a = -8$$

$$x = 5 \rightarrow y = 5^2 - 9$$

$$b = 16$$

$$\text{Slope} = \frac{16 - (-8)}{5 - 1} = 6 //$$

Question ID 5910bfff

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

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

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

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

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

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

Question ID 1697ffcf

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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 ?

Desmos $\rightarrow (0, 0), (5, 5)$
 $a = 5$

Question ID ff2e5c76

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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~~

$$\begin{aligned}\frac{-b}{a} &= \frac{-(-40)}{1} \\ &= 40 //\end{aligned}$$

Question ID 2c5c22d0

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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.

Desmos $\rightarrow$ (1.6, 0)
1 intersection

Question ID fc3dfa26

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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~~ [!] ~~ล้น~~ ≠ 0

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

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

D. 3

Desmos → (0.5, -0.4)
//

Question ID 58b109d4

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ID: 58b109d4

3.20

$$\begin{aligned}x^2 + y + 7 &= 7 \\ 20x + 100 - y &= 0\end{aligned}$$

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

Desmos → (-10, -100)
//

Question ID 7028c74f

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ID: 7028c74f

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

เจอแบบนี้ทำเวดดีกว่า
ระวังทศนิยม
ไม่รู้จบ

3.21

Desmos $\rightarrow (-7, 0), (17.3333, 121.67)$

$$5x + 35 = 15(x^2 - 10x - 119)$$

$$5x + 35 = 15x^2 - 150x - 1785$$

$$0 = 15x^2 - 155x - 1,820$$

$$\frac{-b}{a} = \frac{-(-155)}{15}$$

$$= \frac{31}{3} \text{ or } 10.3333$$

(ตอบอันนี้ดีกว่า)

Question ID e11294f9

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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 ?

$$\frac{-6 \pm \sqrt{6^2 - 4(1)(7)}}{2(1)} = -3 + \sqrt{2}, -3 - \sqrt{2}$$

s r

$$\frac{-8 \pm \sqrt{8^2 - 4(1)(8)}}{2(1)} = -4 + 2\sqrt{2}, -4 - 2\sqrt{2}$$

u t

$$\begin{aligned} r + t &= -3 - \sqrt{2} + (-4) - 2\sqrt{2} = -7 - 3\sqrt{2} \\ s + u &= -3 + \sqrt{2} + (-4) + 2\sqrt{2} = -7 + 3\sqrt{2} \end{aligned}$$

$$(x - (r + t))(x - (s + u)) = (x - (-7 - 3\sqrt{2}))(x - (-7 + 3\sqrt{2}))$$

ถาม C ๓๓ $\text{ผล}_1 \times \text{ผล}_2 = 31$ (เครื่องหมายลบ)

$$\text{หรือ } (-7)^2 - (3\sqrt{2})^2 = 31 //$$