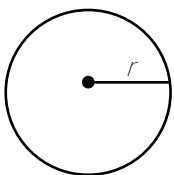




SAT® MATH: DESMOS AND STRATEGIES

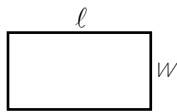
- Desmos is a very powerful tool. This module will go over a lot of the different ways to take advantage of Desmos on the SAT® Math. **THE LAST PAGE OF THIS PACKET IS THE BUBBLE SHEET.**
- You can go to desmos.com/calculator to access this free calculator.
- **Whenever you are working on SAT® Math questions, be in front of a computer to use Desmos and have your graphing calculator.** You can use both during the test.
- **The allotted time to complete this module is 43 minutes.** It might take you longer to complete this module but be sure to put effort into solving each question.
- **Here are some things Desmos can do to help you on the SAT® Math:**
 - Solve any single-variable equation for x .
 - When graphing relations, equations don't need to be set equal to y . Equations and inequalities can just be typed in as given.
 - Automatically calculate intersection points of two equations.
 - Automatically calculate any relative minima, relative maxima, x -intercepts, and y -intercepts.
 - Graph inequalities.
 - Define functions like $f(x)$ and apply translations and transformations to those functions.
 - Calculate the mean and median of a data set.
 - Perform linear regression and quadratic regression.
 - **Most importantly, utilizing a slider for unknown variables.**

REFERENCE

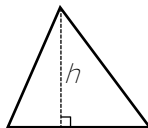


$$A = \pi r^2$$

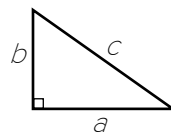
$$C = 2\pi r$$



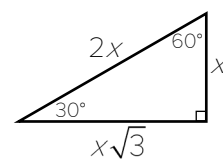
$$A = \ell w$$



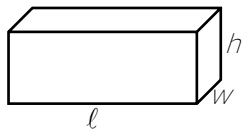
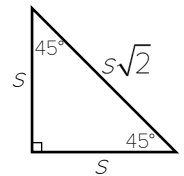
$$A = \frac{1}{2}bh$$



$$c^2 = a^2 + b^2$$



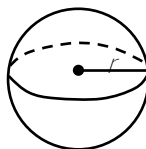
Special Right Triangles



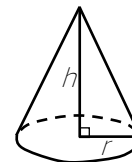
$$V = \ell wh$$



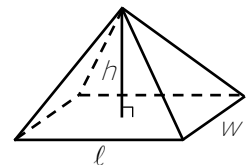
$$V = \pi r^2 h$$



$$V = \frac{4}{3}\pi r^3$$



$$V = \frac{1}{3}\pi r^2 h$$



$$V = \frac{1}{3}\ell wh$$

The number of degrees of arc in a circle is 360.

The number of radians of arc in a circle is 2π .

The sum of the measures in degrees of the angles of a triangle is 180.



SAT® MATH: STRATEGIES TO UTILIZE

Testing Organization

- **Digital SAT® Breakdown:**
 - Students will complete **two 35-minute modules each consisting of 22 questions (about 75% multiple-choice and 25% student produced responses.)** All students will complete the same first module. Based on how students perform on the first module, the second module of questions will either be more difficult or less difficult.
 - Each module contains 2 random experimental questions that will not count toward student scores. We do not know which questions are experimental.
 - While we don't know the exact cutoff for which second module students will receive, we expect students can correctly answer around 12 questions in the first module and still receive the harder second module.
 - There is a big gap in the difficulty level of the easier questions compared to the more difficult questions. The goal is to answer the easier questions as quickly and efficiently as possible so you have enough time to work through and play around with the questions.
- **Nonadaptive Linear SAT® (Paper versions of test for tutoring) Breakdown:**
 - **It's important to know the differences between your timed and untimed scores, keep organized notes, and have study resources.** These tests are slightly longer and are nonadaptive (students receive the same two modules). For these tests, students will complete **two 43-minute modules each consisting of 27 questions (20 multiple-choice questions and 7 student-produced responses.)**
 - If timing is an issue for you on either section, you can always just guess from 1 out of 4 on the multiple-choice questions. **You can't guess with a 1-out-of-4 chance on the grid-in questions. Make sure you attempt answering every grid-in question.**

Approaching Each Question

- The first step to make for every single multiple-choice question is to **look at the four possible answer choices.**
 - When answer choices aren't given as rational numbers, **knowing the format of the correct answer can help ask the question and give you a major hint to setting up and solving the problem.**
 - If you don't look at the four possible answers, you are picking from one out of infinity, but the second you look at those answer choices, you've narrowed it down to one out of four. That is a huge step to take. **Let the answer choices guide you to the correct answer.**
 - While solving, look to cross out choices after every step you make. There are patterns to the answer choices that pair different choices together. Utilize these patterns to improve your odds for each question.
 - Sometimes it can be quicker to cross out three wrong choices than to solve for one correct answer.
 - Guess and check by plugging in the four possible answer choices when necessary. Keep it simple.
- Be careful with graphs and tables. Pay attention to the headers, titles, axes, scales, and if the y -axis is shown.
- All figures on this test **ARE** drawn to scale (unless otherwise noted.) It literally tells you that in the directions.

Desmos

- **USE DESMOS!** Go to desmos.com/calculator to access the same calculator you can use for actual SAT®.
- You should be using both your graphing calculator and Desmos for every SAT® Math practice test you take.

Overall Tips

- **Trust your instincts and do what makes sense to do** based on what is given in the question and choices. You have the time to try something, so try something and see what happens!
 - **Always look to factor.** Factoring is very common. If an expression looks like it can factor, it's probably because you should factor it. If you see the expression $x^2 + 4x + 3$, you might naturally recognize that this can factor. However, if you are given the expression $19x^2 + 417x + 31$, you aren't going to think about factoring that. Again, do what makes sense to do.
- **Always be on the lookout for questions about x - and y -intercepts.** Plugging in zero can be easy.

Answering Student-Produced Response Questions

- If you find **more than one correct answer**, only write one answer.
- Your answer can be up to 5 characters for a **positive** answer and up to 6 characters (including negative) sign) for a **negative answer**, but no more.
- If your answer is a **fraction** that is too long (over 5 characters for positive, 6 characters for negative), write the decimal equivalent.
- If your answer is a **decimal** that is too long (over 5 characters for positive, 6 characters for negative), truncate it or round at the fourth digit.
- If your answer is a **mixed number** (such as $3\frac{1}{2}$), write it as an improper fraction ($7/2$) or its decimal equivalent (3.5).
- Don't include **symbols** such as percent sign, comma, or dollar sign in your circled answer.

Taking Tests vs. Completing Homework Assignments

- Treat each practice test assignment as an actual test. If you want to simulate actual testing conditions, really **focus on training your mind to be as zoned in as possible for the entire time limit**. It's not easy. It takes serious practice. And now is the time to take it seriously.
 - Have you completed this packet? Have you reviewed this packet before taking your next test? Have you spent time reviewing any past test(s) and adding the important stuff to the Content Study Guide and Careless Mistake Checklist at the back of this packet? **Have a game plan set up for each test you take and know how you are going to approach it and handle different areas or scenarios.**
 - We want you to really make an effort to get just a little bit better with each test you take. **You aren't doing this the right way if you are treating your practice tests as homework assignments you just need to complete before your session.**

1

Which of the following values of x is in the solution set of the equation $x^2 + 5x - 14 = 10$?

- A) -24
- B) -8
- C) -7
- D) -3

2

$$y < 2x + 3$$

$$y > -x - 9$$

Which point (x, y) is a solution to the given system of inequalities in the xy -plane?

- A) $(-11, 0)$
- B) $(0, -11)$
- C) $(0, 11)$
- D) $(11, 0)$

3

64, 79, 88, 65, 82, 47, 74, 76, 89, 63

What is the median of the list of numbers above?

- A) 73
- B) 74
- C) 75
- D) 76

4

What is the set of all solutions to the equation

$$\sqrt{x+6} = -x ?$$

- A) $\{-2, 3\}$
- B) $\{-2\}$
- C) $\{3\}$
- D) There are no solutions to the given equation.

5

$$3x - 6y = 9$$

$$7y - 4x = -16$$

Which of the following ordered pairs (x, y) satisfies the system of equations above?

- A) $(3, 4)$
- B) $(9, -16)$
- C) $(11, 4)$
- D) $\left(-\frac{22}{5}, -\frac{37}{10}\right)$

6

$$\sqrt{5x+1} - x = \sqrt{x-2}$$

What value of x satisfies the equation above?

7

$$2x + 5y = 14$$

$$3x - 2y = -36$$

If (x, y) is a solution to the system of equations above, what is the value of $10x + 6y$?

8

t hours after container is closed	Number of Bacteria
10	1,257
14	1,385
19	1,545

The table above shows how many bacteria are in a container t hours after the container has been closed. If the relationship between the number of bacteria and the time is linear, which of the following functions, B , models how many bacteria are in the container after t hours?

- A) $B(t) = 32t + 937$
- B) $B(t) = 32 + 937t$
- C) $B(t) = 32t + 1257$
- D) $B(t) = 32 + 1257t$

9

$$\begin{aligned} 5x - 4y &= 17 \\ kx - 12y &= 9 \end{aligned}$$

In the system of equations above, k is a constant and x and y are variables. For what value of k will the system of equations have no solution?

- A) -15
- B) -5
- C) 5
- D) 15

10

$$\frac{3(x-2)}{x+3} = 2 + \frac{1}{x+3}$$

What is the solution set to the equation above?

- A) $\{-3\}$
- B) $\{9\}$
- C) $\{11\}$
- D) $\{13\}$

11

$$3 - 2(ax - 5) = 8x + 13$$

In the equation above, a is a constant. For what value of a does the equation have infinitely many solutions?

- A) -8
- B) -4
- C) 4
- D) 8

12

$$\begin{aligned} y &= x^2 + 19x - 7 \\ 3x - y &= 67 \end{aligned}$$

The graphs of the two equations above intersect at two points. If (a, b) is one of the points of intersection, what could be the value of a ?

- A) -97
- B) -85
- C) -10
- D) 6

13

$$9x^2 + bx + 4 = 0$$

In the quadratic equation shown, b is a constant. If the equation only has one real solution, what is the smallest possible value of b ?

14

If $3(5x - 1) - 4 = 5x - 1$, what is the value of $5x - 1$?

15

$$3ax + 21 = 8(x - 2) - 2(x + 3)$$

In the equation above, a is a constant. If no value of x satisfies the equation, what is the value of a ?

- A) 2
- B) 3
- C) 6
- D) 10

16

$$f(x) = 2x^2 + 68x + 563$$

The given equation defines the function f . For what value of x does $f(x)$ reach its minimum?

- A) -17
- B) -15
- C) 68
- D) 563

17

Which of the following functions has(have) a maximum value at $x = 5$?

- I. $-2(3)^x - 5$
- II. $3(2)^{x-5} + 5$

- A) I only
- B) II only
- C) I and II
- D) Neither I nor II

18

In the xy -plane, the graph of the equation $y = x + 6$ intersects the graph of the equation $y = x^2$ at two points. What is the sum of the x -coordinates of the two points?

- A) -5
- B) -1
- C) 1
- D) 5

19

A scientist is observing certain species of lemurs in Madagascar. The table below shows an original data set of the total amount of fruit, in pounds, 6 different lemurs consumed in an observed day.

Lemur	Fruit (in pounds)
A	22
B	27
C	20
D	26
E	24
F	21

A seventh lemur who ate 18 pounds of fruit that day is added to the data set. Which of the following correctly compares the means of the two data sets?

- A) The mean of the original data set is greater than the mean of the new data set.
- B) The mean of the original data set is less than the mean of the new data set.
- C) The means of both data sets are equal.
- D) There is not enough information to compare the means.

20

$$f(x) = -4x^2 - 8x + 320$$

The given equation defines the function f . What is the maximum value of $f(x)$?

21

$$-x^2 + bx - 441 = 0$$

In the given equation, b is a positive integer. The equation has no real solutions. What is the greatest possible value of b ?

22

$$4|1-x| + 3|1-x| = 28$$

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

- A) -15
- B) -3
- C) 2
- D) 5

23

$$x^2 + y^2 - 6x + 4y = 12$$

The equation of a circle in the xy -plane is shown above. What is the radius of the circle?

- A) $\sqrt{12}$
- B) 5
- C) 10
- D) 12

A certain quadratic function, $f(x)$, contains the points (0, 4), (2, 2), and (4, 16). Which of the following gives the equation of the function?

- A) $f(x) = 2x^2 - 5x - 4$
- B) $f(x) = 2x^2 + 5x - 4$
- C) $f(x) = 2x^2 - 5x + 4$
- D) $f(x) = 2x^2 + 5x + 4$

$$f(x) = (x+5)(x-1)(x-4)$$

The function f is given. Which table of values represents $y = f(x+3) - 2$?

A)

x	y
-5	0
1	0
4	0

B)

x	y
-5	-2
1	-2
4	-2

C)

x	y
-8	0
-2	0
1	0

D)

x	y
-8	-2
-2	-2
1	-2

$$kx + y = -3$$

$$y = x^2 + k$$

In the system of equations above, k is a constant. When the equations are graphed in the xy -plane, the graphs intersect at exactly two points. Which of the following is a possible value of k ?

- A) 1
- B) 3
- C) 5
- D) 7

$$2(x+3) + 5(y-7) = 112$$

$$2(x+3) - 3(y-7) = 94$$

The solution to the given system of equations is (x, y) . What is the value of $24(y-7)$?

END OF MODULE. YOU'RE DONE!
SUBMIT YOUR ANSWERS AT MALLYACT.COM



SAT® MATH MODULE BUBBLE SHEET

For multiple-choice questions, solve each problem and choose the correct answer from the choices provided. You will not get credit for questions with more than one answer circled, or for questions with no answers circled.

For student-produced response questions:

- If you find **more than one correct answer**, only write one answer.
- Your answer can be up to 5 characters for a **positive** answer and up to 6 characters (including negative) sign) for a **negative answer**, but no more.
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- Don't include **symbols** such as percent sign, comma, or dollar sign in your circled answer.

SAT® Math: Math Test 41 – Desmos Module

1. ☐ A ☐ B ☐ C ☐ D
2. ☐ A ☐ B ☐ C ☐ D
3. ☐ A ☐ B ☐ C ☐ D
4. ☐ A ☐ B ☐ C ☐ D
5. ☐ A ☐ B ☐ C ☐ D

8. ☐ A ☐ B ☐ C ☐ D
9. ☐ A ☐ B ☐ C ☐ D
10. ☐ A ☐ B ☐ C ☐ D
11. ☐ A ☐ B ☐ C ☐ D
12. ☐ A ☐ B ☐ C ☐ D

15. ☐ A ☐ B ☐ C ☐ D
16. ☐ A ☐ B ☐ C ☐ D
17. ☐ A ☐ B ☐ C ☐ D
18. ☐ A ☐ B ☐ C ☐ D
19. ☐ A ☐ B ☐ C ☐ D

22. ☐ A ☐ B ☐ C ☐ D
23. ☐ A ☐ B ☐ C ☐ D
24. ☐ A ☐ B ☐ C ☐ D
25. ☐ A ☐ B ☐ C ☐ D
26. ☐ A ☐ B ☐ C ☐ D

6.

13.

20.

27.

7.

14.

21.

TO THE EXACT SECOND, please let us know how much total time you spent on this module?

When completed, submit your answers at mallyact.com