Desmos Speedrun Playbook

Regression, lists, arrays and sliders: the fastest Desmos methods for Digital SAT Math, with the exact thing to type.

Ronak

34 SKILLS · 2ND EDITION

CHAPTER 1

Fundamental Desmos Operations

The foundation tools you need before the advanced speedrun techniques. Fast practical and free of clutter.

1.1 Linear functions and systems

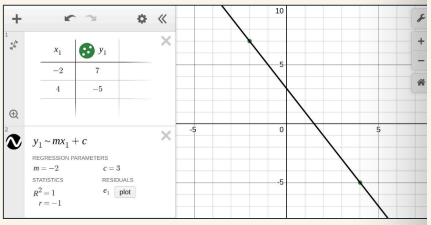
SKILL 01 **Find the equation of a line (linear regression)** DESMOS

Given two points, or one point and a known slope, you can get the exact slope m ar at once.

1. Create a table: click + and choose Table.
2. Enter the x-values under x_1 and the y-values under y_1.
3. Type the command below on a new line.

TYPE THIS INTO DESMOS

```
y1 ~ mx1 + c
```



Points (-2, 7) and (4, -5). Desmos returns m = -2 and c = 3, so the line is y = -2x + 3.

With two or more points you can also press the Regression button on the table.

If you are given **one point and a slope**, type the slope straight into the regression. V point Desmos cannot find both m and c, so the slope has to be a number:

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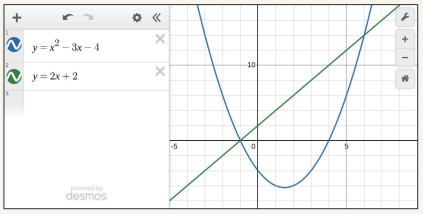
Table: the single point $(8, -1)$. Desmos returns $c = 5$.



$x^2 - 3x - 4 = 2x + 2$: graph each side and click the intersections, x = -1 and x = 6.

SPEED ADVANTAGE

Method 4 is often the best way to solve an equation, because the graph also shows the special cases:

- **No solution:** the graphs never meet.
- **Infinitely many solutions:** the graphs lie on top of each other.

These are easy to miss when you only calculate.

SKILL 03 **Translating a graph** DESMOS

Define the original function as `f(x) = ...`. Then define a second function with the shift, for example `g(x) = f(x) + 3` (up 3) or `g(x) = f(x) - 3` (down 3). You can now read points on the translated graph without redoing any calculation.

1.2 Fractions, percentages, variables and statistics

SKILL 04 **Fractions, percentages and exact values** DESMOS

Fraction or decimal. After a result appears, press the round fraction button on the left of the line to switch between decimal and fraction. To type a mixed number, type the whole part, press Space, then type the fraction.

Percentages. Desmos understands the percent sign only together with the word "of":

TYPE THIS INTO DESMOS

```
12% of 200
```

FIXED IN THIS EDITION

The first edition showed `12% + 5% * 200` as an input. Real Desmos rejects it with the message "% must be used with of". Always write the percentage as `12% of 200`, or type the decimal (0.12) yourself.

Keep exact values. To reuse a long value without retyping it or rounding it, store it in a letter:

STUCK IN SAT · MATH LIBRARY

Desmos Speedrun Playbook

The advanced Desmos methods for Digital SAT Math.

Ronak · Second Edition, 2026

WHAT IS NEW IN THIS EDITION

- Every input was typed again into the real Desmos calculator. Three that did not behave as printed were fixed.
- A one-page map up front: **Desmos, formula, or both?** Every skill in the book carries that label.
- Four new skills, including one trap where Desmos gives a wrong answer without any warning.
- An answer key for every Try It Yourself question, with the input we used.

Every screenshot in this book is from desmos.com. Every input was typed into the real Desmos calculator.

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START HERE

How to use this playbook

This playbook makes Desmos a speed-and-accuracy tool for Digital SAT Math. It does not replace understanding. It helps you recognize common SAT structures, choose the most efficient method, and execute it correctly under time pressure.

The way to study it

1. Read the explanation before you try to memorize the syntax.
2. Recreate every worked example yourself in Desmos.
3. Compare your screen with the screenshot in the chapter.
4. Practice the method until the input feels natural.
5. Revisit the Quick Reference before mocks and before test day.

Three symbols you must recognize instantly

Symbol	Use it for
=	Ordinary equations, definitions and graphing.
~	Regression: when Desmos must find unknown constants for you.
[ ]	Lists and array regressions.

How we write the inputs

Inside a yellow-edged box you see the keys to press, exactly as you type them. So `x1^2` means: type x, then 1 (Desmos makes the subscript by itself), then ^2. The screenshot next to it shows how Desmos displays it: x_1^2.

Every worked example was typed into the real calculator before it went into this book. Where Desmos returns a decimal such as 1.41421, we show you how to read it as the exact answer.

FINAL TAKEAWAY

Do not try to memorize every command at once. First learn to identify the **type of question**. Once you recognize the pattern, the right Desmos input is much easier to remember and to use under pressure. The next page shows you how to decide.

MY NOTES

THE DECISION MAP

Desmos, formula, or both?

Almost 90% of our students ask the same two things when they learn Desmos tricks: ***how do I remember all of them, and how do I decide in the exam whether a question is Desmos, by hand, or both?*** *This page is our answer. Use it on every question in this book.*

DESMOS

Numbers in, a number out.

- Solve an equation or a system
- Where two graphs meet
- A value of a function
- A table of points to an equation
- Mean, median, spread of a list
- An unknown constant that regression can find

FORMULA

One line by hand beats typing.

- Sum and product of roots: $-\frac{b}{a}$ and $\frac{c}{a}$
- $a+b+c$ is just $f(1)$
- Circle center from the coefficients
- No solution or infinitely many: compare the ratios
- Arithmetic you can do in 10 seconds

BOTH

Formula sets it up, Desmos finishes (or checks).

- A constant that gives exactly one or no solution, when the answer is exact like 3.75 or $2\sqrt{3}$
- "Which could be the value" questions
- Any answer you got by algebra and want to confirm in 5 seconds

MY NOTES

Four questions, in this order

1 **Can I do it in my head in under 10 seconds?** Then do it. Typing costs more.

2 **Is there a one-line rule for exactly this?** Sum of roots, $f(1)$, the ratio rule, the circle shortcut. If yes: **FORMULA**.

3 **Is everything a number, and do I need a number? DESMOS**: type it as written, graph, click.

4 **Is there an unknown constant (k, a, p)? DESMOS** with a regression ($\sim$). If the answer must be exact, or a slider will not land on it, it is **BOTH**: get the exact value from the formula, then let Desmos confirm.

HOW TO READ THE REST OF THE BOOK

From here on, every skill has a number and a label: DESMOS, FORMULA or BOTH. It is our honest verdict on what is fastest in the exam. Where a formula beats the Desmos trick, we say so.

One warning. Desmos is not right just because it shows a number. A regression can stop on a wrong answer and report it calmly (see Skill 27 and Skill 31). Use lists, add the restriction the question gives, and check the result in the question.

MY NOTES

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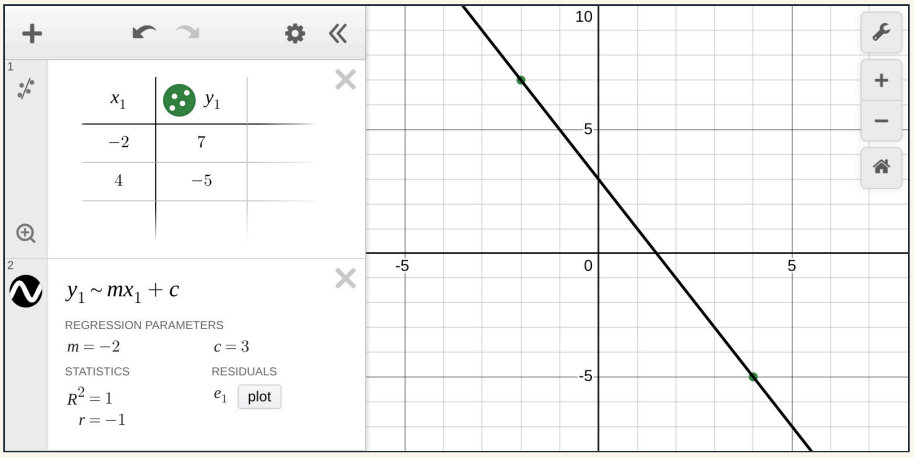

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