

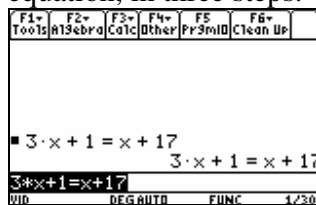
Getting an overview of moves for solving equations.
"Do the Same to Both Sides", until solutions are easy to see.

These exercises are to help you develop strategies for solving equations by "doing the same to both sides". If two things are equal, and we "do the same to both sides" (DSBS), then they stay equal. A solution to the last equation will be a solution to all of them. The trick is to DSBS until the solution reveals itself. With the TI-89, using the Home screen, you can experiment quickly, and try out new ideas without making calculation and algebra errors.

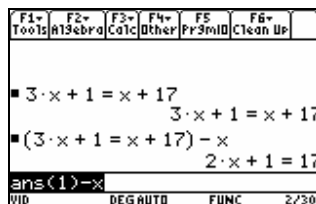
Instructions

The worksheet asks you to solve equations using DSBS in many different ways. For each example you will need to enter the equation into your CAS first and press Enter.

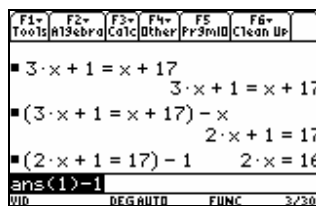
Example: First I entered the equation. Next I subtracted x from both sides. Then I subtracted 1 from both sides. Then next I divided both sides of the equation by 2, and this has solved the equation, in three steps.



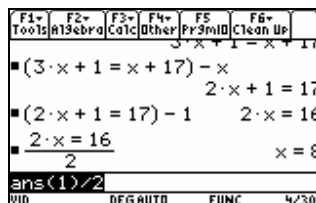
First enter the equation.



-Y T[x] This subtracts x from both sides (DSBS)



-Y T[1] Subtracting 1 from both sides of previous.



-Y Φ[2] Dividing both sides by 2 makes the solution obvious.

$$3x + 1 = x + 17$$

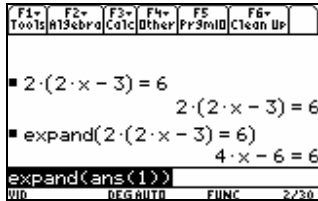
$$2x + 1 = 17$$

$$2x = 16$$

$$x = 8$$

Write down the equation and the result of each step.

In some examples, you may need the expand command, which works like this.



Algebra, select Expand, \rightarrow E

DSBS worksheet

Q1. Solve these equations in three or less DSBS steps.

(a) $3x - 5 = 4$

(b) $4a - 2 = 6$

(c) $3 + 5y = 23$

(d) $27 = 8x - 5$

(e) $2 - y = 14$

(f) $-5m = 35$

(g) $\frac{2x + 1}{3} = 5$

(h) $\frac{14}{3x} = 7$

(i) $5 + x = 2x - 1$

(j) $3x - 1 = -x$

Q2. Solve these equations in THREE different ways each. (Doing operations in a different order counts as a 'different way'). Outline the steps.

(a) $8x+17=20$

(b) $5+x = 2x-1$

(c) $3t-1 = -t$

(d) $\frac{4x-5}{3}=6$

Q3. Solve these in as few DSBS steps as possible. You might also need to use the "expand" command (see instructions file)

(a) $8x-5 = -13$

(b) $5y +3 = -y +7$

(d) $27 = 3(8x-5)$

(e) $\frac{6x+1}{3}=x+1$

(f) $5-x = 3(2x-1) + x$

(g) $3x-1 = \frac{-x}{4}$

(h) $\frac{2}{3}x+1=9$

(i) $\frac{3}{5}x-2=x-6$