

NAME: ANSWER KEY

BUILDING & SOLVING LINEAR EQUATIONS

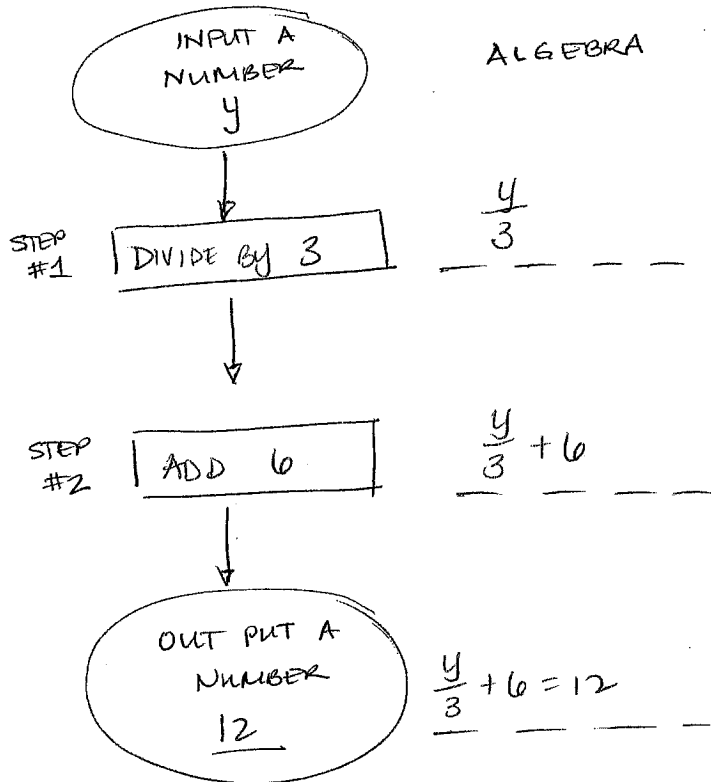
Here is an algebra machine. The Algebra column shows what happens to the unknown. Solve the equation. Show and explain all your steps.

	<div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block;">INPUT A NUMBER 7</div>	ALGEBRA	
	↓		
STEP #1	SUBTRACT 1	X-1	Use this space to solve the equation: $\frac{2(x-1) = 8}{2 \quad 2}$ <div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block; margin: 5px;">reverse step #2</div> $x-1 = 4$
	↓		
STEP #2	MULTIPLY BY 2	2(X-1)	<div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block; margin: 5px;">reverse step #1</div> $\frac{+1 \quad +1}{\boxed{x=5}}$
	↓		
	OUTPUT A NUMBER 8	2(X-1)=8	

Here is another algebra machine. The Algebra column shows what happens to the unknown. Solve the equation. Show and explain all your steps.

	<div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block;">INPUT A NUMBER y</div>	ALGEBRA	
	↓		
STEP #1	ADD 4	y+4	Use this space to solve the equation: $\frac{3(y+4) = 9}{3 \quad 3}$ <div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block; margin: 5px;">reverse step #2</div> $y+4 = 3$
	↓		
STEP #2	MULTIPLY BY 3	3(y+4)	<div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block; margin: 5px;">reverse step #1</div> $\frac{-4 \quad -4}{\boxed{y=-1}}$
	↓		
	OUTPUT A NUMBER 9	3(y+4)=9	

Here is a third algebra machine. The Algebra column shows what happens to the unknown. Solve the equation. Show and explain all your steps.



Use this space to solve the equation:

$$\frac{y}{3} + 6 = 12$$

reverse step #2

$$\frac{y}{3} + 6 - 6 = 12 - 6$$

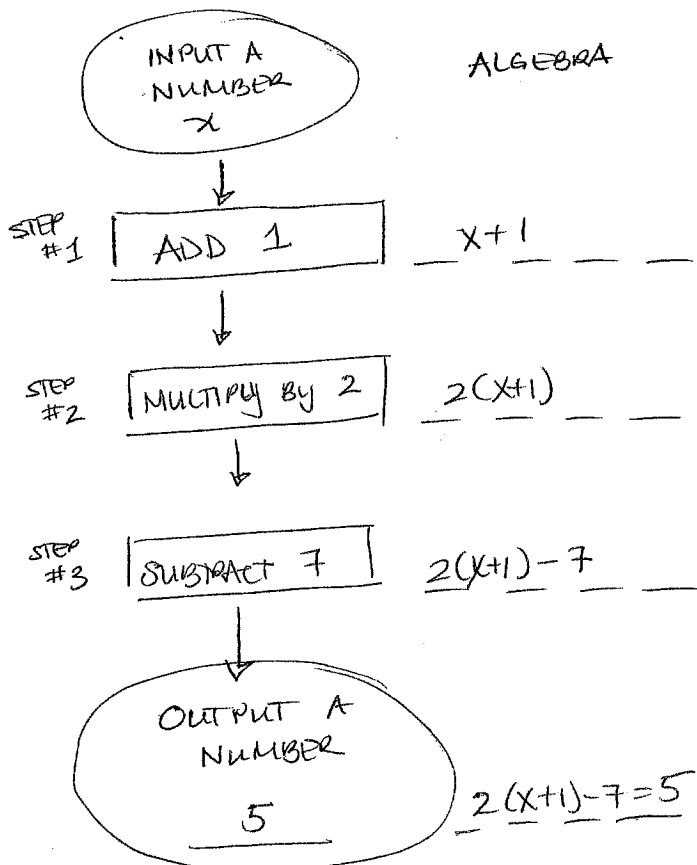
$$\frac{y}{3} = 6$$

reverse step #1

$$3 \times \frac{y}{3} = 6 \times 3$$

$$y = 18$$

Here is a final algebra machine. The Algebra column shows what happens to the unknown. Solve the equation. Show and explain all your steps.



Use this space to solve the equation:

$$2(x+1)-7=5$$

reverse step #3

$$2(x+1)-7+7=5+7$$

$$2(x+1)=12$$

reverse step #2

$$\frac{2(x+1)}{2} = \frac{12}{2}$$

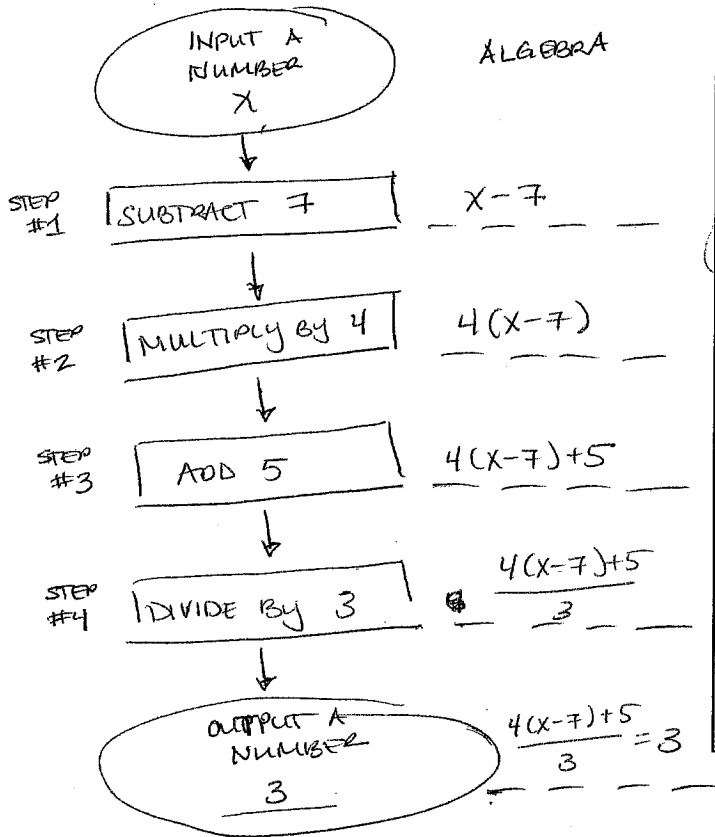
$$(x+1)=6$$

reverse step #1

$$(x+1)-1=6-1$$

$$x=5$$

Here is an algebra machine. The Algebra column shows what happens to the unknown. Solve the equation. Show and explain all your steps.



Use this space to solve the equation:

$$3 \cdot \frac{4(x-7)+5}{3} = 3 \cdot 3$$

reverse step #4

$$4(x-7)+5 = 9$$

reverse step #3

$$\begin{array}{r} + 5 \\ - 5 \\ \hline 4(x-7) = 4 \end{array}$$

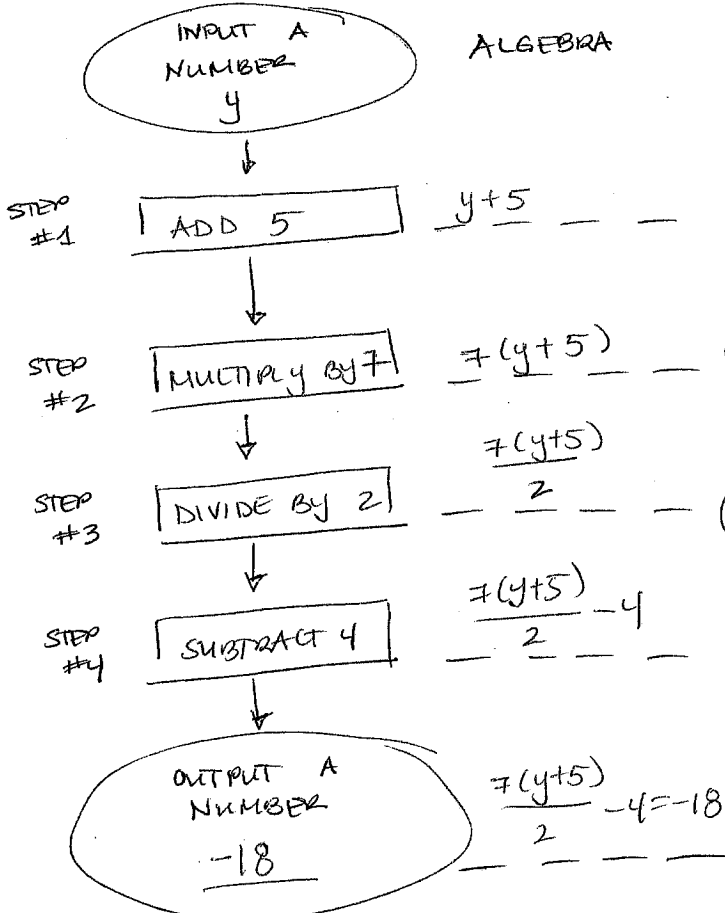
reverse step #2

$$\begin{array}{r} 4(x-7) = 4 \\ \div 4 \\ \hline x-7 = 1 \end{array}$$

reverse step #1

$$\begin{array}{r} x-7 = 1 \\ + 7 \\ \hline \boxed{x = 8} \end{array}$$

Here is a final algebra machine. The Algebra column shows what happens to the unknown. Solve the equation. Show and explain all your steps.



Use this space to solve the equation:

$$\frac{7(y+5)}{2} - 4 = -18$$

reverse step #4

$$\begin{array}{r} \frac{7(y+5)}{2} - 4 = -18 \\ \phantom{\frac{7(y+5)}{2}} + 4 \\ \hline \frac{7(y+5)}{2} = -14 \end{array}$$

reverse step #3

$$2 \cdot \frac{7(y+5)}{2} = -14 \cdot 2$$

reverse step #2

$$\begin{array}{r} 7(y+5) = -28 \\ \div 7 \\ \hline y+5 = -4 \end{array}$$

reverse step #1

$$\begin{array}{r} y+5 = -4 \\ - 5 \\ \hline \boxed{y = -9} \end{array}$$