

Example 5**Self Tutor**Solve for x : **a** $\frac{x}{4} + 7 = 5$ **b** $\frac{1}{3}(x + 2) = 6$

$$\mathbf{a} \quad \frac{x}{4} + 7 = 5$$

$$\therefore \frac{x}{4} + 7 - 7 = 5 - 7 \quad \{\text{subtracting 7 from both sides}\}$$

$$\therefore \frac{x}{4} = -2$$

$$\therefore \frac{x}{4} \times 4 = -2 \times 4 \quad \{\text{multiplying both sides by 4}\}$$

$$\therefore x = -8$$

$$\text{Check: } \frac{-8}{4} + 7 = -2 + 7 = 5 \quad \checkmark$$

$$\mathbf{b} \quad \frac{1}{3}(x + 2) = 6$$

$$\therefore \frac{1}{3}(x + 2) \times 3 = 6 \times 3 \quad \{\text{multiplying both sides by 3}\}$$

$$\therefore x + 2 = 18$$

$$\therefore x + 2 - 2 = 18 - 2 \quad \{\text{subtracting 2 from both sides}\}$$

$$\therefore x = 16$$

$$\text{Check: } \frac{1}{3}(16 + 2) = \frac{1}{3} \times 18 = 6 \quad \checkmark$$

The inverse of -3 is $+3$.
The inverse of $\times 2$ is $\div 2$.

**Example 6****Self Tutor**Solve for x : $4(2x + 5) - 3(x - 2) = 16$

$$4(2x + 5) - 3(x - 2) = 16$$

$$\therefore 8x + 20 - 3x + 6 = 16 \quad \{\text{expanding brackets}\}$$

$$\therefore 5x + 26 = 16 \quad \{\text{collecting like terms}\}$$

$$\therefore 5x + 26 - 26 = 16 - 26 \quad \{\text{subtracting 26 from both sides}\}$$

$$\therefore 5x = -10$$

$$\therefore x = -2 \quad \{\text{dividing both sides by 5}\}$$

$$\text{Check: } 4(2 \times (-2) + 5) - 3((-2) - 2)$$

$$= 4 \times 1 - 3 \times (-4) = 4 + 12 = 16 \quad \checkmark$$

Use the **distributive law**

$$a(b + c) = ab + ac.$$

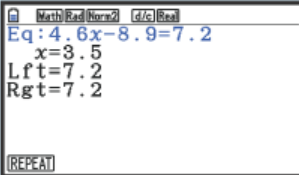


Example 8**Self Tutor**Solve for x : $(x - 3)^2 = (4 + x)(2 + x)$

$$\begin{aligned}
(x - 3)^2 &= (4 + x)(2 + x) \\
\therefore x^2 - 6x + 9 &= 8 + 4x + 2x + x^2 && \{\text{expanding each side}\} \\
\therefore x^2 - 6x + 9 - x^2 &= 8 + 4x + 2x + x^2 - x^2 && \{\text{subtracting } x^2 \text{ from both sides}\} \\
\therefore -6x + 9 &= 8 + 6x \\
\therefore -6x + 9 + 6x &= 8 + 6x + 6x && \{\text{adding } 6x \text{ to both sides}\} \\
\therefore 9 &= 12x + 8 \\
\therefore 9 - 8 &= 12x + 8 - 8 && \{\text{subtracting } 8 \text{ from both sides}\} \\
\therefore 1 &= 12x \\
\therefore \frac{1}{12} &= \frac{12x}{12} && \{\text{dividing both sides by } 12\} \\
\therefore x &= \frac{1}{12}
\end{aligned}$$

Example 11**Self Tutor**Solve using technology: $4.6x - 8.9 = 7.2$

Casio fx-CG20

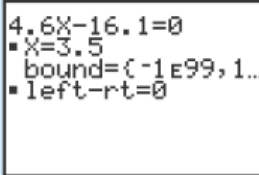


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Eq: 4.6x-8.9=7.2
x=3.5
Lft=7.2
Rgt=7.2
(REPEAT)

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TI-84 Plus

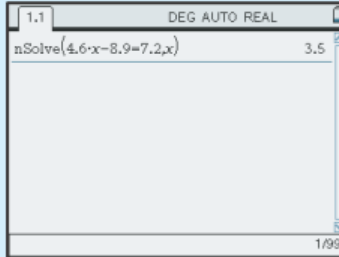


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4.6X-16.1=0
X=3.5
bound={-1E99,1...
left-rt=0

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TI-nspire



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1.1 DEG AUTO REAL
nSolve(4.6x-8.9=7.2,x) 3.5
1/99

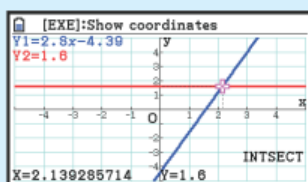
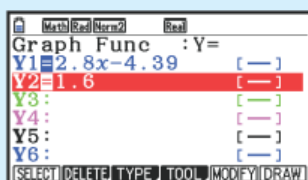
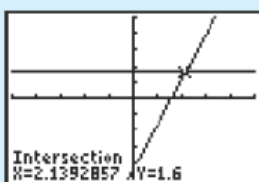
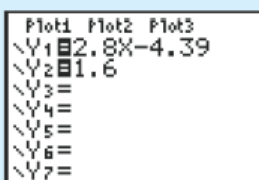
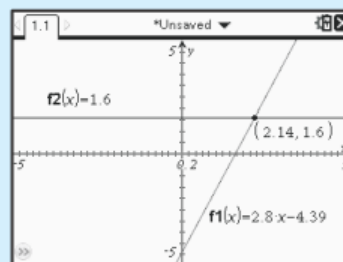
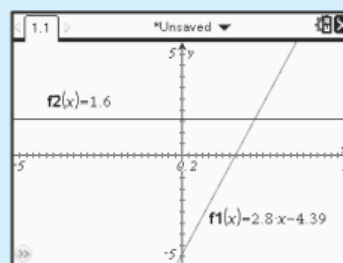
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Using technology, $x = 3.5$

Example 12

Solve the equation $2.8x - 4.39 = 1.6$ graphically.

We graph $Y_1 = 2.8X - 4.39$ and $Y_2 = 1.6$ on the same set of axes, then find their point of intersection.

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So, the solution is $x \approx 2.14$.