NudgeLearn

Grade 8 · Math

Linear Equations

Answer key | 8.EE.C.7

14 problems

1. Solve for x:

$$3x + 4 = 19$$

Answer $x = 5$

Subtract 4: $3x = 15$. Divide by 3: $x = 5$.

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2. Solve for x:

$$5x - 7 = 2x + 8$$

Answer $x = 5$

Subtract $2x$: $3x - 7 = 8$. Add 7: $3x = 15$, so $x = 5$.

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3. Solve for x:

$$7x + 2 = 4x + 17$$

Answer $x = 5$

Subtract $4x$: $3x + 2 = 17$. Subtract 2: $3x = 15$, so $x = 5$.

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4. Solve for n:

$$8n - 3 = 5n + 12$$

Answer $n = 5$

Subtract $5n$: $3n - 3 = 12$. Add 3: $3n = 15$, so $n = 5$.

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5. Solve for x:

$$2(x + 4) = 3x - 1$$

Answer $x = 9$

Distribute: $2x + 8 = 3x - 1$. Subtract $2x$: $8 = x - 1$, so $x = 9$.

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6. Solve for y:

$$4(2y - 1) = 6y + 10$$

Answer $y = 7$

Distribute: $8y - 4 = 6y + 10$. Subtract $6y$: $2y - 4 = 10$, so $2y = 14$ and $y = 7$.

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7. Solve for x:

$$6x + 5 = 6x + 5$$

Answer **Infinitely many solutions**

Both sides are identical, so the equation is true for every value of x: infinitely many solutions.

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8. Solve for x:

$$4x + 9 = 4x - 3$$

Answer **No solution**

Subtract $4x$: $9 = -3$, which is false. The equation has no solution.

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9. Solve for x:

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

Answer **No solution**

Distribute: $3x - 6 = 3x + 5$. Subtract $3x$: $-6 = 5$, which is false. No solution.

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10. Solve for x:

$$2(3x + 1) = 6x + 2$$

Answer **Infinitely many solutions**

Distribute: $6x + 2 = 6x + 2$. The sides are identical, so it is true for all x: infinitely many solutions.

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11. Solve for x:

$$\frac{1}{2}x + 3 = \frac{1}{4}x + 7$$

Answer $x = 16$

Subtract $\frac{1}{4}x$: $\frac{1}{4}x + 3 = 7$. Subtract 3: $\frac{1}{4}x = 4$, so $x = 16$.

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12. How many solutions does the equation $5x - 2 = 5(x - 1) + 3$ have?

Answer **D) Infinitely many solutions**

Right side: $5x - 5 + 3 = 5x - 2$. Both sides equal $5x - 2$, so it is true for all x.

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13. Two phone plans cost the same per month. Plan A charges $\$20$ plus $\$5$ per gigabyte. Plan B charges $\$35$ plus $\$2$ per gigabyte. For how many gigabytes g do the plans cost the same?

Answer $g = 5$ **gigabytes**

Set costs equal: $20 + 5g = 35 + 2g$. Subtract $2g$: $20 + 3g = 35$, so $3g = 15$ and $g = 5$.

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14. Maya and Leo start with different amounts and save weekly. Maya has $\$50$ and saves $\$8$ per week. Leo has $\$74$ and saves $\$5$ per week. After how many weeks w will they have the same amount?

Answer $w = 8$ **weeks**

Set amounts equal: $50 + 8w = 74 + 5w$. Subtract $5w$: $50 + 3w = 74$, so $3w = 24$ and $w = 8$.