

Linear Equations

Ex1

$$x + 2 = 6$$

$$x + 2 - 2 = 6 - 2$$

$$x = 6 - 2$$

$$\underline{x = 4}$$

Ex2

$$y - 3 = 5$$

$$y - 3 + 3 = 5 + 3$$

$$y = 5 + 3$$

$$\underline{y = 8}$$

Ex3

$$2x = 10$$

$$\frac{2x}{2} = \frac{10}{2}$$

$$x = \frac{10}{2}$$

$$\underline{x = 5}$$

Ex4

$$\frac{x}{4} = 8$$

$$\frac{x}{4} \times 4 = 8 \times 4$$

$$x = 8 \times 4$$

$$\underline{x = 32}$$

Ex5

$$2x + 3 = 11$$

$$2x = 11 - 3$$

$$2x = 8$$

$$x = \frac{8}{2}$$

$$\underline{x = 4}$$

Ex6

$$5x - 3 = 17$$

$$5x = 17 + 3$$

$$5x = 20$$

$$x = \frac{20}{5}$$

$$\underline{x = 4}$$

Exercise

1) $x + 9 = 11$

2) $x - 3 = 4$

3) $3x = 12$

4) $\frac{x}{2} = 5$

5) $x + 1 = 8$

6) $x - 5 = 7$

7) $7x = 21$

8) $\frac{x}{3} = 5$

9) $x + 4 = 1$

10) $x - 5 = -4$

11) $2x = 15$

12) $\frac{x}{10} = 4$

13) $2x + 5 = 19$

14) $3x - 2 = 16$

15) $4x + 3 = 23$

16) $5x - 7 = 43$

17) $6x + 2 = 20$

18) $7x - 5 = 23$

19) $2x - 7 = 8$

20) $3x + 5 = 19$

LINEAR EQUATIONS 1EXERCISE

1) $x + 9 = 11$
 $x = 11 - 9$
 $x = 2$

7) $7x = 21$
 $x = \frac{21}{7}$
 $x = 3$

2) $x - 3 = 4$
 $x = 4 + 3$
 $x = 7$

8) $\frac{x}{3} = 5$
 $x = 5 \times 3$
 $x = 15$

3) $3x = 12$
 $x = \frac{12}{3}$
 $x = 4$

9) $x + 4 = 1$
 $x = 1 - 4$
 $x = -3$

4) $\frac{x}{2} = 5$
 $x = 5 \times 2$
 $x = 10$

10) $x - 5 = -4$
 $x = -4 + 5$
 $x = 1$

5) $x + 1 = 8$
 $x = 8 - 1$
 $x = 7$

11) $2x = 15$
 $x = \frac{15}{2}$
 $x = 7\frac{1}{2}$

6) $x - 5 = 7$
 $x = 7 + 5$
 $x = 12$

12) $\frac{x}{10} = 4$
 $x = 4 \times 10$
 $x = 40$

3 of 4

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LINEAR EQUATIONS 1EXERCISE

$$\begin{aligned}13) \quad & 2x + 5 = 19 \\ & 2x = 19 - 5 \\ & 2x = 14 \\ & x = \frac{14}{2} \\ & x = 7\end{aligned}$$

$$\begin{aligned}16) \quad & 5x - 7 = 43 \\ & 5x = 43 + 7 \\ & 5x = 50 \\ & x = \frac{50}{5} \\ & x = 10\end{aligned}$$

$$\begin{aligned}14) \quad & 3x - 2 = 16 \\ & 3x = 16 + 2 \\ & 3x = 18 \\ & x = \frac{18}{3} \\ & x = 6\end{aligned}$$

$$\begin{aligned}17) \quad & 6x + 2 = 20 \\ & 6x = 20 - 2 \\ & 6x = 18 \\ & x = \frac{18}{6} \\ & x = 3\end{aligned}$$

$$\begin{aligned}15) \quad & 4x + 3 = 23 \\ & 4x = 23 - 3 \\ & 4x = 20 \\ & x = \frac{20}{4} \\ & x = 5\end{aligned}$$

$$\begin{aligned}18) \quad & 7x - 5 = 23 \\ & 7x = 23 + 5 \\ & 7x = 28 \\ & x = \frac{28}{7} \\ & x = 4\end{aligned}$$

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LINEAR EQUATIONS IEXERCISE

19) $2x - 7 = 8$

$2x = 8 + 7$

$2x = 15$

$x = \frac{15}{2}$

$x = 7\frac{1}{2}$

20) $3x + 5 = 19$

$3x = 19 - 5$

$3x = 14$

$x = \frac{14}{3}$

$x = 4\frac{2}{3}$

Eqns with an x term on both sides

Ex 7

$7x + 8 = 3x + 56$

$7x - 3x = +56 - 8$

$4x = 48$

$x = \frac{48}{4}$

$x = 12$

Ex 8

$5x + 32 = 14 - 5x$

$5x + 5x = 14 - 32$

$10x = -18$

$x = -\frac{18}{10}$

$x = -1.8$

or $-1\frac{8}{10}$

or $-1\frac{4}{5}$

Equations Involving Brackets

Ex 9

$$3(2x+1) = 33$$

or

$$3(2x+1) = 33$$

$$6x + 3 = 33$$

$$2x+1 = \frac{33}{3}$$

$$6x = 33 - 3$$

$$2x+1 = 11$$

$$6x = 30$$

$$2x = 11 - 1$$

$$x = \frac{30}{6}$$

$$2x = 10$$

$$x = \frac{10}{2}$$

$$\underline{x = 5}$$

$$\underline{x = 5}$$

Ex 10

$$2(5x+3) = 3(x+1) + 17$$

$$10x + 6 = 3x + 3 + 17$$

$$10x - 3x = +3 + 17 - 6$$

$$7x = 14$$

$$x = \frac{14}{7}$$

$$\underline{x = 2}$$



①

LINEAR EQUATIONS (2)EXERCISE

Solve the following equations:

1. $3x - 7 = 23$

2. $5x + 3 = 25$

3. $8x - 2 = 4x + 10$

4. $3x + 7 = 27 - x$

5. $9x - 3 = 7x + 8$

6. $2x - 5 = 16 - 5x$

7. $2(x + 3) = 18$

8. $4(x - 5) = 8$

9. $3(2x + 7) = 30$

10. $5(2x - 3) = 25$

LINEAR EQUATIONS (2)

②

EXERCISE

1. $3x - 7 = 23$

$3x = 23 + 7$

$3x = 30$

$x = \frac{30}{3}$

$x = 10$

2. $5x + 3 = 25$

$5x = 25 - 3$

$5x = 22$

$x = \frac{22}{5}$

$x = 4\frac{2}{5}$

3. $8x - 2 = 4x + 10$

$8x - 4x = +10 + 2$

$4x = 12$

$x = \frac{12}{4}$

$x = 3$

4. $3x + 7 = 27 - x$

$3x + x = 27 - 7$

$4x = 20$

$x = \frac{20}{4}$

$x = 5$

5. $9x - 3 = 7x + 8$

$9x - 7x = 8 + 3$

$2x = 11$

$x = \frac{11}{2}$

$x = 5\frac{1}{2}$

6. $2x - 5 = 16 - 5x$

$2x + 5x = 16 + 5$

$7x = 21$

$x = \frac{21}{7}$

$x = 3$

LINEAR EQUATIONS (2)③
EXERCISE

7. $2(x+3) = 18$
 $2x + 6 = 18$
 $2x = 18 - 6$
 $2x = 12$
 $x = \frac{12}{2}$
 $x = 6$

8. $4(x-5) = 8$
 $4x - 20 = 8$
 $4x = 8 + 20$
 $4x = 28$
 $x = \frac{28}{4}$
 $x = 7$

9. $3(2x+7) = 30$
 $6x + 21 = 30$
 $6x = 30 - 21$
 $6x = 9$
 $x = \frac{9}{6}$
 $x = \frac{3}{2} \text{ or } x = \frac{1}{2}$

10. $5(2x-3) = 25$
 $10x - 15 = 25$
 $10x = 25 + 15$
 $10x = 40$
 $x = \frac{40}{10}$
 $x = 4$

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Word Problems Involving Linear Equations

Ex1

Alan is twice as old as Bill

Colin is 5 years older than Alan

Colin is 17. How old is Bill?

Let Bill be x years old

$$\text{Alan} = 2x$$

$$\text{Colin} = 2x + 5$$

$$2x + 5 = 17$$

$$2x = 17 - 5$$

$$2x = 12$$

$$x = \frac{12}{2} \quad x = 6$$

Bill is 6 years old

Ex2

John's dad is 3 times as old as John

In 12 years time dad will be twice

as old as John. How old is John now?

Let John be x now

Dad now $3x$

In 12 years time John $x + 12$

Dad $3x + 12$

$$3x + 12 = 2(x + 12)$$

$$3x + 12 = 2x + 24$$

$$3x - 2x = 24 - 12$$

$$x = 12$$

John is now 12 years old

13. The sum of three consecutive odd integers is 189. What are the integers?

Let lowest be x

the others are $x+2$, $x+4$

$$x + x + 2 + x + 4 = 189$$

$$3x + 6 = 189$$

$$3x = 189 - 6$$

$$3x = 183$$

$$x = \frac{183}{3}$$

$$x = 61$$

Numbers are 61, 63, 65
