



# Solving 1-step equations

Mana Maths

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# Te reo Māori terms



**whārite**

equation

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**whakaoti**

solve

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**taurangi**

variable

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**mahi**

operation

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# Notes & Steps



## Key idea

Do the inverse (opposite) to both sides. Whatever you do to one side, do to the other.

**Inverse operations**

**Solve:**  $3x = 15$

$$+x \leftrightarrow -x$$

$$\times x \leftrightarrow \div x$$

$$3x = 15$$

$$\frac{3x}{3} = \frac{15}{3}$$

$$x = 5$$

**Solve:**  $x + 5 = 12$

$$x + 5 = 12$$

$$x + 5 - 5 = 12 - 5$$

$$x = 7$$

Check:  $3 \times 5 = 15 \checkmark$

**Solve:**  $\frac{x}{4} = 7$

$$\frac{x}{4} = 7$$

Check:  $7 + 5 = 12 \checkmark$

# Notes & Steps



**Solve:**  $x - 3 = 8$

$$x - 3 = 8$$

$$x - 3 + 3 = 8 + 3$$

$$x = 11$$

Check:  $11 - 3 = 8 \checkmark$

## Remember:

- ▶ + undone by -
- ▶ - undone by +
- ▶  $\times$  undone by  $\div$
- ▶  $\div$  undone by  $\times$

## Try these

1.  $x + 7 = 15$

2.  $x - 5 = 9$

3.  $4x = 20$

4.  $\frac{x}{3} = 6$

## Common mistake

Mixing up inverse. For  $x - 4 = 10$  you *add* 4 (not subtract 4). Undo what's been done to  $x$ .

# Start Tasks



**1.** Solve  $x + 3 = 7$

**2.** Solve  $x + 5 = 9$

**3.** Solve  $x + 2 = 8$

**4.** Solve  $x + 4 = 10$

**5.** Solve  $x - 1 = 6$

**6.** Solve  $x - 3 = 5$

**7.** Solve  $x - 2 = 4$

**8.** Solve  $x + 6 = 11$

**9.** Solve  $x - 4 = 3$

# Start Tasks — Answers



**1.**  $x + 3 = 7$

$x = 4$  (subtract 3)

**2.**  $x + 5 = 9$

$x = 4$  (subtract 5)

**3.**  $x + 2 = 8$

$x = 6$  (subtract 2)

**4.**  $x + 4 = 10$

$x = 6$  (subtract 4)

**5.**  $x - 1 = 6$

$x = 7$  (add 1)

**6.**  $x - 3 = 5$

$x = 8$  (add 3)

**7.**  $x - 2 = 4$

$x = 6$  (add 2)

**8.**  $x + 6 = 11$

$x = 5$  (subtract 6)

**9.**  $x - 4 = 3$

$x = 7$  (add 4)

# Start Tasks



**10.** Solve  $x + 7 = 12$

**11.** Solve  $x - 5 = 2$

**12.** Solve  $x + 8 = 14$

**13.** Solve  $x - 6 = 1$

**14.** Solve  $x + 9 = 15$

**15.** Solve  $x - 7 = 3$

**16.** Solve  $x + 10 = 17$

**17.** Solve  $x - 8 = 2$

**18.** Solve  $x + 11 = 18$

# Start Tasks – Answers



**10.**  $x + 7 = 12$   
 $x = 5$  (subtract 7)

**13.**  $x - 6 = 1$   
 $x = 7$  (add 6)

**16.**  $x + 10 = 17$   
 $x = 7$  (subtract 10)

**11.**  $x - 5 = 2$   
 $x = 7$  (add 5)

**14.**  $x + 9 = 15$   
 $x = 6$  (subtract 9)

**17.**  $x - 8 = 2$   
 $x = 10$  (add 8)

**12.**  $x + 8 = 14$   
 $x = 6$  (subtract 8)

**15.**  $x - 7 = 3$   
 $x = 10$  (add 7)

**18.**  $x + 11 = 18$   
 $x = 7$  (subtract 11)

# Start Tasks



**19.** Solve  $x - 9 = 4$

**20.** Solve  $x + 12 = 20$

**21.** Solve  $x - 10 = 5$

**22.** Solve  $x + 13 = 21$

**23.** Solve  $x - 11 = 3$

**24.** Solve  $x + 14 = 22$

**25.** Solve  $x - 12 = 4$

**26.** Solve  $x + 15 = 24$

**27.** Solve  $x - 13 = 2$

# Start Tasks — Answers



**19.**  $x - 9 = 4$   
 $x = 13$  (add 9)

**22.**  $x + 13 = 21$   
 $x = 8$  (subtract 13)

**25.**  $x - 12 = 4$   
 $x = 16$  (add 12)

**20.**  $x + 12 = 20$   
 $x = 8$  (subtract 12)

**23.**  $x - 11 = 3$   
 $x = 14$  (add 11)

**26.**  $x + 15 = 24$   
 $x = 9$  (subtract 15)

**21.**  $x - 10 = 5$   
 $x = 15$  (add 10)

**24.**  $x + 14 = 22$   
 $x = 8$  (subtract 14)

**27.**  $x - 13 = 2$   
 $x = 15$  (add 13)

# Build Tasks



**1.** Solve  $2x = 8$

**2.** Solve  $3x = 12$

**3.** Solve  $4x = 20$

**4.** Solve  $5x = 15$

**5.** Solve  $6x = 18$

**6.** Solve  $7x = 21$

**7.** Solve  $8x = 24$

**8.** Solve  $9x = 27$

**9.** Solve  $4x = 16$

# Build Tasks – Answers



1.  $2x = 8$

$x = 4$  (divide by 2)

4.  $5x = 15$

$x = 3$  (divide by 5)

7.  $8x = 24$

$x = 3$  (divide by 8)

2.  $3x = 12$

$x = 4$  (divide by 3)

5.  $6x = 18$

$x = 3$  (divide by 6)

8.  $9x = 27$

$x = 3$  (divide by 9)

3.  $4x = 20$

$x = 5$  (divide by 4)

6.  $7x = 21$

$x = 3$  (divide by 7)

9.  $4x = 16$

$x = 4$  (divide by 4)

# Build Tasks



**10.** Solve  $\frac{x}{2} = 5$

**11.** Solve  $\frac{x}{3} = 4$

**12.** Solve  $\frac{x}{4} = 6$

**13.** Solve  $\frac{x}{5} = 3$

**14.** Solve  $2a = 10$

**15.** Solve  $3b = 15$

**16.** Solve  $4m = 12$

**17.** Solve  $5n = 20$

**18.** Solve  $6p = 30$

# Build Tasks – Answers



10.  $\frac{x}{2} = 5$

$x = 10$  (multiply by 2)

13.  $\frac{x}{5} = 3$

$x = 15$  (multiply by 5)

16.  $4m = 12$

$m = 3$  (divide by 4)

11.  $\frac{x}{3} = 4$

$x = 12$  (multiply by 3)

14.  $2a = 10$

$a = 5$  (divide by 2)

17.  $5n = 20$

$n = 4$  (divide by 5)

12.  $\frac{x}{4} = 6$

$x = 24$  (multiply by 4)

15.  $3b = 15$

$b = 5$  (divide by 3)

18.  $6p = 30$

$p = 5$  (divide by 6)

# Build Tasks



19. Solve  $\frac{y}{2} = 7$

20. Solve  $\frac{a}{3} = 5$

21. Solve  $\frac{m}{4} = 3$

22. Solve  $\frac{p}{5} = 4$

23. Solve  $\frac{x}{6} = 2$

24. Solve  $\frac{x}{7} = 3$

25. Solve  $3x = 9$

26. Solve  $7y = 28$

27. Solve  $8z = 32$

# Build Tasks — Answers



19.  $\frac{y}{2} = 7$

$y = 14$  (multiply by 2)

22.  $\frac{p}{5} = 4$

$p = 20$  (multiply by 5)

25.  $3x = 9$

$x = 3$  (divide by 3)

20.  $\frac{a}{3} = 5$

$a = 15$  (multiply by 3)

23.  $\frac{x}{6} = 2$

$x = 12$  (multiply by 6)

26.  $7y = 28$

$y = 4$  (divide by 7)

21.  $\frac{m}{4} = 3$

$m = 12$  (multiply by 4)

24.  $\frac{x}{7} = 3$

$x = 21$  (multiply by 7)

27.  $8z = 32$

$z = 4$  (divide by 8)

# Push Tasks



1. Solve  $x + 5 = 2$

2. Solve  $x - 3 = -1$

3. Solve  $2x + 3 = 7$

4. Solve  $3x - 2 = 10$

5. Solve  $\frac{x}{2} + 1 = 5$

6. Solve  $\frac{x}{3} - 2 = 4$

7. Solve  $4x - 5 = 7$

8. Solve  $5x + 2 = 12$

9. Solve  $\frac{x}{4} + 3 = 7$

# Push Tasks — Answers



**1.**  $x + 5 = 2$

$x = -3$  (subtract 5)

**2.**  $x - 3 = -1$

$x = 2$  (add 3)

**3.**  $2x + 3 = 7$

$2x = 4, x = 2$

**4.**  $3x - 2 = 10$

$3x = 12, x = 4$

**5.**  $\frac{x}{2} + 1 = 5$

$\frac{x}{2} = 4, x = 8$

**6.**  $\frac{x}{3} - 2 = 4$

$\frac{x}{3} = 6, x = 18$

**7.**  $4x - 5 = 7$

$4x = 12, x = 3$

**8.**  $5x + 2 = 12$

$5x = 10, x = 2$

**9.**  $\frac{x}{4} + 3 = 7$

$\frac{x}{4} = 4, x = 16$

# Push Tasks



**10.** Solve  $-2x = 8$

**11.** Solve  $-3x = 15$

**12.** Solve  $-4x = 20$

**13.** Solve  $-5x = 25$

**14.** Solve  $x + 8 = 3$

**15.** Solve  $x - 2 = -5$

**16.** Solve  $2x + 7 = 13$

**17.** Solve  $3x - 4 = 11$

**18.** Solve  $\frac{x}{5} + 2 = 6$

# Push Tasks — Answers



**10.**  $-2x = 8$

$x = -4$  (divide by  $-2$ )

**13.**  $-5x = 25$

$x = -5$  (divide by  $-5$ )

**16.**  $2x + 7 = 13$

$2x = 6, x = 3$

**11.**  $-3x = 15$

$x = -5$  (divide by  $-3$ )

**14.**  $x + 8 = 3$

$x = -5$  (subtract 8)

**17.**  $3x - 4 = 11$

$3x = 15, x = 5$

**12.**  $-4x = 20$

$x = -5$  (divide by  $-4$ )

**15.**  $x - 2 = -5$

$x = -3$  (add 2)

**18.**  $\frac{x}{5} + 2 = 6$

$\frac{x}{5} = 4, x = 20$

# Push Tasks



**19.** Check: is  $x = 3$  the solution to  $2x + 1 = 7$ ?

**20.** Check: is  $x = 4$  the solution to  $3x - 2 = 10$ ?

**21.** Check: is  $x = 2$  the solution to  $4x + 3 = 11$ ?

**22.** A number plus 5 equals 12. Find the number.

**23.** Three times a number is 21. Find the number.

**24.** A number divided by 4 equals 6. Find the number.

**25.** Five more than twice a number is 13. Find the number.

**26.** Seven less than three times a number is 14. Find the number.

**27.** Write an equation for: a number plus 8 equals 20. Solve it.

# Push Tasks — Answers



**19.** Check  $x = 3$  in

$$2x + 1 = 7$$

$$2(3) + 1 = 7 \checkmark$$

**20.** Check  $x = 4$  in

$$3x - 2 = 10$$

$$3(4) - 2 = 10 \checkmark$$

**21.** Check  $x = 2$  in

$$4x + 3 = 11$$

$$4(2) + 3 = 11 \checkmark$$

**22.** Number  $+ 5 = 12$

$$x + 5 = 12, x = 7$$

**23.** 3 times a number =  
21

$$3x = 21, x = 7$$

**24.** Number  $\div 4 = 6$

$$\frac{x}{4} = 6, x = 24$$

**25.** Five more than

$$2x = 13$$

$$2x + 5 = 13, x = 4$$

**26.** Seven less than

$$3x = 14$$

$$3x - 7 = 14, x = 7$$

**27.** Number  $+ 8 = 20$

$$x + 8 = 20, x = 12$$