

GRADE 8 MATHEMATICS

Linear Equations

Complete Printable Worksheet Pack

6 Practice Worksheets • 6 Answer Keys

Proper school-mathematics notation • A4 printable • Grade 8 level

Name: _____ Date: _____

Worksheet 1 — One-Step & Two-Step Equations

Show your working. For reasoning questions, explain your method clearly.

1. Solve: $x + 7 = 19$.

2. Solve: $y - 9 = 14$.

3. Solve: $5a = 45$.

4. Solve: $b \div 6 = 8$.

5. Solve: $3x + 5 = 26$.

6. Solve: $4y - 7 = 29$.

7. Solve: $8m + 3 = 51$.

8. Solve: $7p - 10 = 32$.

9. A number increased by 13 is 28. Write and solve an equation.

10. Challenge: Three times a number decreased by 8 is 37. Find the number.

Working space:

Answer Key 1 — One-Step & Two-Step Equations

1. $x = 12$

2. $y = 23$

3. $a = 9$

4. $b = 48$

5. $x = 7$

6. $y = 9$

7. $m = 6$

8. $p = 6$

9. $n + 13 = 28$, so $n = 15$

10. $3n - 8 = 37$, so $n = 15$

Worksheet 2 — Variables on Both Sides

Show your working. For reasoning questions, explain your method clearly.

1. Solve: $5x + 3 = 2x + 18$.

2. Solve: $7y - 4 = 3y + 20$.

3. Solve: $9a + 5 = 4a + 30$.

4. Solve: $6m - 7 = 2m + 13$.

5. Solve: $8p + 11 = 5p + 29$.

6. Solve: $10r - 6 = 4r + 18$.

7. Solve: $3x + 14 = 7x - 10$.

8. Solve: $12n - 5 = 8n + 23$.

9. Explain why subtracting the same variable term from both sides keeps an equation balanced.

10. Challenge: Solve $4(2x + 3) = 5x + 27$.

Working space:

Answer Key 2 — Variables on Both Sides

1. $x = 5$

2. $y = 6$

3. $a = 5$

4. $m = 5$

5. $p = 6$

6. $r = 4$

7. $x = 6$

8. $n = 7$

9. It preserves equality because the same amount is changed on both sides.

10. $x = 5$

Worksheet 3 — Brackets & Fractions in Equations

Show your working. For reasoning questions, explain your method clearly.

1. Solve: $3(x + 4) = 27$.

2. Solve: $5(y - 2) = 35$.

3. Solve: $2(3a + 1) = 20$.

4. Solve: $4(m + 5) - 6 = 26$.

5. Solve: $3(p - 4) + 5 = 20$.

6. Solve: $x/4 + 3 = 8$.

7. Solve: $y/5 - 2 = 6$.

8. Solve: $(2a + 6)/3 = 8$.

9. Solve: $5(b - 2) = 3b + 14$.

10. Challenge: Solve $2(3x - 1) + 4 = 20$.

Working space:

Answer Key 3 — Brackets & Fractions in Equations

1. $x = 5$

2. $y = 9$

3. $a = 3$

4. $m = 3$

5. $p = 9$

6. $x = 20$

7. $y = 40$

8. $a = 9$

9. $b = 12$

10. $x = 3$

Worksheet 4 — Decimal & Multi-Step Equations

Show your working. For reasoning questions, explain your method clearly.

1. Solve: $0.5x = 6$.
2. Solve: $2.5y + 3 = 13$.
3. Solve: $1.2a - 4 = 8$.
4. Solve: $0.4m + 2.8 = 6.8$.
5. Solve: $3.5p - 2 = 12$.
6. Solve: $0.6r + 1.5 = 5.1$.
7. Solve: $2.4x - 3.6 = 8.4$.
8. Solve: $1.5(n + 2) = 12$.
9. A number multiplied by 2.5 and then increased by 4 equals 19. Find the number.
10. Challenge: Solve $0.5(4x - 6) + 2 = 9$.

Working space:

Answer Key 4 — Decimal & Multi-Step Equations

1. $x = 12$

2. $y = 4$

3. $a = 10$

4. $m = 10$

5. $p = 4$

6. $r = 6$

7. $x = 5$

8. $n = 6$

9. $2.5n + 4 = 19$, so $n = 6$

10. $x = 5$

Worksheet 5 — Linear Equations in Real-Life Problems

Show your working. For reasoning questions, explain your method clearly.

1. A number plus 18 equals 47. Find the number.
2. Five identical notebooks cost \$35 in total. Find the cost of one notebook.
3. A taxi charges a \$6 fixed fee plus \$3 per kilometre. The fare is \$30. How many kilometres were travelled?
4. A rectangle has width 7 cm and perimeter 34 cm. Find its length using an equation.
5. A phone plan costs \$15 per month plus \$4 per GB. A bill is \$39. How many GB were used?
6. A savings account starts with \$50. After saving the same amount each week for 8 weeks, the balance is \$130. How much was saved each week?
7. A school club has some students. After 12 more join, there are 35. How many were there originally?
8. Three equal-price tickets plus a \$5 booking fee cost \$50. Find the ticket price.
9. A temperature is 7 degrees below a number. The temperature is 18°C . Find the number.
10. Challenge: A rectangle's length is 4 cm more than its width. Its perimeter is 36 cm. Find both dimensions.

Working space:

Answer Key 5 — Linear Equations in Real-Life Problems

1. 29
2. \$7
3. 8 km
4. $2(l + 7) = 34$, so $l = 10$ cm
5. 6 GB
6. \$10 per week
7. 23 students
8. \$15
9. 25°C
10. Width = 7 cm, length = 11 cm

Worksheet 6 — Linear Equations Challenge & Reasoning

Show your working. For reasoning questions, explain your method clearly.

1. Solve: $7x - 5 = 3x + 19$.
2. Solve: $4(2y - 3) = 5y + 12$.
3. Solve: $3(a + 5) - 2a = 17$.
4. Solve: $(x + 5)/3 = (x - 1)/2$.
5. Solve: $0.8m + 2.4 = 1.2m - 4.8$.
6. Find the error: $2x + 6 = 18$, so $2x = 18 + 6$ and $x = 12$. Explain the mistake and solve correctly.
7. A student says the equation $5x + 2 = 5x + 8$ has a solution. Is that possible? Explain.
8. Solve: $2(3p + 1) - 4 = 4p + 10$.
9. A number is multiplied by 3, then 7 is subtracted. The result equals twice the number plus 5. Find the number.
10. Challenge: A rectangle has length $(2x + 1)$ cm and width $(x + 2)$ cm. Its perimeter is 38 cm. Find x and both dimensions.

Working space:

Answer Key 6 — Linear Equations Challenge & Reasoning

1. $x = 6$

2. $y = 8/3$

3. $a = 2$

4. $x = 11$

5. $m = 18$

6. Correct: $2x = 12$, so $x = 6$; the 6 should be subtracted, not added.

7. No solution; subtracting $5x$ gives $2 = 8$, which is impossible.

8. $p = 6$

9. $3n - 7 = 2n + 5$, so $n = 12$

10. $2[(2x + 1) + (x + 2)] = 38$, so $x = 5$; length = 11 cm, width = 7 cm