

GRADE 8 MATHEMATICS

Linear Equations in Real-Life Problems

Complete Printable Worksheet Pack

6 Practice Worksheets • 6 Answer Keys

Translate real situations into equations • Solve • Explain • Check

Name: _____ Date: _____

Worksheet 1 — Writing Equations from Situations

Define the unknown clearly, write an equation, solve it, and include units where appropriate.

1. A number increased by 17 is 42. Write an equation and find the number.
2. Three times a number is 57. Find the number.
3. A number decreased by 9 is 26. Find the number.
4. Five identical notebooks cost \$45. Let n be the price of one notebook. Write and solve an equation.
5. A taxi charges \$8 plus \$3 per kilometre. The fare is \$32. Find the distance travelled.
6. A movie ticket costs \$12. A family spends \$60. How many tickets did they buy?
7. A number divided by 4 is 13. Find the number.
8. A number is doubled and then increased by 5 to give 31. Find the number.
9. A number is multiplied by 6 and then decreased by 4 to give 38. Find the number.
10. Challenge: Four times a number plus 7 equals 3 times the number plus 19. Find the number.

Working space:

Answer Key 1 — Writing Equations from Situations

1. $n + 17 = 42$, $n = 25$

2. $3n = 57$, $n = 19$

3. $n - 9 = 26$, $n = 35$

4. $5n = 45$, $n = \$9$

5. $8 + 3k = 32$, $k = 8$ km

6. $12t = 60$, $t = 5$ tickets

7. $n/4 = 13$, $n = 52$

8. $2n + 5 = 31$, $n = 13$

9. $6n - 4 = 38$, $n = 7$

10. $4n + 7 = 3n + 19$, $n = 12$

Worksheet 2 — Money & Shopping Problems

Define the unknown clearly, write an equation, solve it, and include units where appropriate.

1. A shirt costs \$18 more than a pair of socks. Together they cost \$54. Find the price of each item.
2. Three identical books and a \$6 notebook cost \$51. Find the price of one book.
3. A shop gives a \$15 discount on an item. The sale price is \$45. Find the original price.
4. Five pens and a \$3 pencil case cost \$28. Find the price of one pen.
5. A customer buys 4 identical T-shirts and pays \$96. Find the price of one T-shirt.
6. A bag costs twice as much as a wallet. Together they cost \$90. Find both prices.
7. A student has \$75 and spends \$8 each week for some weeks, leaving \$27. How many weeks did the student spend?
8. A jacket is \$20 more than twice the price of a cap. Together they cost \$110. Find both prices.
9. A shop's total sales from 6 identical items is \$138. Find the price per item.
10. Challenge: After a \$12 discount, an item costs 3 times the price of a \$16 accessory. Find the item's original price.

Working space:

Answer Key 2 — Money & Shopping Problems

1. Socks = \$18, shirt = \$36
2. $3b + 6 = 51$, $b = \$15$
3. $p - 15 = 45$, $p = \$60$
4. $5p + 3 = 28$, $p = \$5$
5. \$24
6. Wallet = \$30, bag = \$60
7. $75 - 8w = 27$, $w = 6$
8. Cap = \$30, jacket = \$80
9. \$23
10. $3 \times 16 = 48$; original price $- 12 = 48$, so original price = \$60

Worksheet 3 — Age, Number & Relationship Problems

Define the unknown clearly, write an equation, solve it, and include units where appropriate.

1. Mia is 4 years older than Sam. Their ages total 30. Find both ages.
2. A father is 3 times as old as his son. Their ages total 52. Find their ages.
3. One number is 7 more than another. Their sum is 41. Find both numbers.
4. One number is twice another. Their difference is 18. Find both numbers.
5. A number is 5 less than three times another number. Their sum is 27. Find both numbers.
6. A rectangle's length is 5 cm more than its width. Its perimeter is 34 cm. Find both dimensions.
7. A triangle has sides x , $x + 3$ and $x + 5$ cm. Its perimeter is 32 cm. Find x and all side lengths.
8. Two consecutive integers have a sum of 57. Find them.
9. Three consecutive integers have a sum of 72. Find them.
10. Challenge: Two numbers have a sum of 50. The larger is 4 more than twice the smaller. Find both.

Working space:

Answer Key 3 — Age, Number & Relationship Problems

1. Sam = 13, Mia = 17
2. Son = 13, father = 39
3. 17 and 24
4. 18 and 36
5. 8 and 19
6. Width = 6 cm, length = 11 cm
7. $x = 8$; sides 8, 11, 13 cm
8. 28 and 29
9. 23, 24, 25
10. Smaller = 16, larger = 34

Worksheet 4 — Distance, Travel & Geometry Problems

Define the unknown clearly, write an equation, solve it, and include units where appropriate.

1. A cyclist travels at 12 km/h for h hours and covers 60 km. Find h .
2. A car has already travelled 45 km and then travels 15 km each hour. The total distance is 120 km. How many hours did it travel?
3. A train travels 80 km more than a bus. Together they travel 560 km. Find each distance.
4. A rectangle has length 3 cm more than twice its width. Its perimeter is 54 cm. Find its dimensions.
5. A square has perimeter 68 cm. Find its side length.
6. A triangle has base x cm and height 10 cm. Its area is 75 cm^2 . Find x .
7. A rectangle has area 96 cm^2 and width 8 cm. Find its length.
8. A garden is 4 m longer than it is wide. Its perimeter is 40 m. Find its dimensions.
9. A runner completes a 5 km route in t minutes at an average rate of 0.25 km/min. Find t .
10. Challenge: A rectangular field has length $2w + 6$ metres and perimeter 72 metres. Find its length and width.

Working space:

Answer Key 4 — Distance, Travel & Geometry Problems

1. $12h = 60$, $h = 5$ hours
2. $45 + 15h = 120$, $h = 5$ hours
3. Bus = 240 km, train = 320 km
4. Width = 8 cm, length = 19 cm
5. 17 cm
6. $\frac{1}{2} \times x \times 10 = 75$, $x = 15$ cm
7. 12 cm
8. Width = 8 m, length = 12 m
9. $0.25t = 5$, $t = 20$ minutes
10. Width = 10 m, length = 26 m

Worksheet 5 — Multi-Step Real-Life Problems

Define the unknown clearly, write an equation, solve it, and include units where appropriate.

1. A club charges \$25 to join plus \$8 per month. The total paid is \$81. How many months were paid?
2. A savings plan starts with \$120 and adds \$15 each week. When will the balance reach \$300?
3. A phone plan costs \$20 plus \$5 per GB. A bill is \$65. How many GB were used?
4. A school bus holds 48 students. There are 6 more students on the first bus than the second. Together they carry 90 students. How many students are on each bus?
5. A shop marks an item down by \$18, then charges a \$7 delivery fee. The customer pays \$49. Find the marked price.
6. A number is increased by 20%, giving 72. Find the original number.
7. A rectangular poster is 6 cm wider than its height. Its perimeter is 52 cm. Find both dimensions.
8. A worker earns \$15 per hour plus a \$20 bonus. The total pay is \$140. How many hours did the worker work?
9. A school collects a fixed \$50 donation plus \$12 from each student. The total is \$302. How many students donated?
10. Challenge: A two-digit number has a tens digit that is 3 more than its units digit. The sum of the digits is 11. Find the number.

Working space:

Answer Key 5 — Multi-Step Real-Life Problems

1. $25 + 8m = 81$, $m = 7$ months
2. $120 + 15w = 300$, $w = 12$ weeks
3. $20 + 5g = 65$, $g = 9$ GB
4. Second = 42, first = 48
5. $p - 18 + 7 = 49$, $p = \$60$
6. $1.2n = 72$, $n = 60$
7. Height = 10 cm, width = 16 cm
8. $15h + 20 = 140$, $h = 8$ hours
9. $50 + 12s = 302$, $s = 21$ students
10. Units = 4, tens = 7, so the number is 74

Worksheet 6 — Real-Life Equations Challenge & Reasoning

Define the unknown clearly, write an equation, solve it, and include units where appropriate.

1. A number is doubled, then 9 is added. The result is 45. Find the number.
2. A number is multiplied by 5, then 12 is subtracted. The result is twice the number plus 9. Find the number.
3. A rectangle has length $(x + 4)$ cm and width $(x - 1)$ cm. Its perimeter is 34 cm. Find x and both dimensions.
4. A taxi fare is \$7 plus \$2.50 per kilometre. A passenger pays \$32. Find the distance travelled.
5. A book is 3 times the price of a notebook. Together they cost \$48. Find both prices.
6. A student solved $4x + 8 = 2x + 20$ and got $x = 2$. Check the solution and correct it.
7. A cinema sells adult tickets for \$14 and child tickets for \$9. Eight tickets cost \$97. How many of each type were sold?
8. A rectangle has area 84 cm^2 . Its length is 5 cm more than its width. Find both dimensions.
9. A number is decreased by 15, then the result is divided by 3 to give 9. Find the number.
10. Challenge: A school has some buses. If 4 students move from each bus to another arrangement, the number per bus changes from 28 to 24. How many buses are involved if the total number of students is 168?

Working space:

Answer Key 6 — Real-Life Equations Challenge & Reasoning

1. $2n + 9 = 45$, $n = 18$
2. $5n - 12 = 2n + 9$, $n = 7$
3. $x = 6$; dimensions 10 cm and 5 cm
4. $7 + 2.5d = 32$, $d = 10$ km
5. Notebook = \$12, book = \$36
6. $x = 6$; substitute: $24 + 8 = 32$ and $12 + 20 = 32$
7. Adult = 5, child = 3
8. Width = 7 cm, length = 12 cm
9. $(n - 15)/3 = 9$, $n = 42$
10. $168 \div 28 = 6$ buses; $168 \div 24 = 7$, so the stated situation is inconsistent. There is no single number of buses satisfying both conditions.