

UNIT 7: EQUATIONS

Exercise 1: Solve the following equations:

- a) $7x - 8 + 9x + 5 = 2x - 3 + 7 - 8x - x$
- b) $5 - 2x - 7x + 9 = 3x - 8 - 5x - 1$
- c) $x + 3x + 7 - 12 + 5x - 19 = 2x + 8 - 5x + 10 - x - 5$
- d) $9 - 3x + 2x - 8 = 5x - 2 + 7x - 13x + 5$

Exercise 2: Solve the following equations:

- a) $5(x + 7) + 4(2x + 1) = 3(4x - 3)$
- b) $5x - 2(x + 3) = 8x - 5(2x + 1)$
- c) $7 - (x - 5) = 2x - (5x + 3)$
- d) $7x - 3(4x - 8) = 6 - 2(5x + 9)$
- e) $-2x + 6(3x - 8) = 9x - 5(x - 2) + 12x$
- f) $3x - 7 - 4(1 - x) = 5 - (x - 9)$
- g) $1 - (x - 5) - 2(x + 3) = 5 - (3x + 5)$
- h) $3(x - 1) - (x - 2) = 2x - 8$

Exercise 3: Solve the following equations:

- a) $5x + 7 + 8x + 1 = 12x - 3 + 3x$
- b) $5x - 2x + 3 - 12 = 8x - 5 - 10x + 1$
- c) $7(x - 5) = 2(x - 6) - (3x + 1)$
- d) $7(x - 1) - 4(4x - 2) = 6x - 5(2x + 4)$
- e) $25x - 3(6x - 7) = 9x - 2(x - 5)$
- f) $-7x - 5(2 - 3x) = 17x - 12 - (9x - 2)$

Exercise 4: Solve the following equations:

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| <ul style="list-style-type: none"> a) $\frac{2x-7}{4} + \frac{3-x}{3} = \frac{8-3x}{2}$ c) $\frac{x+3}{10} - \frac{2x-4}{6} = x + \frac{5-x}{5}$ e) $\frac{3(3x-2)}{7} - \frac{2(x-4)}{4} = x - \frac{5(x+1)}{14}$ | <ul style="list-style-type: none"> b) $\frac{5x-12}{15} - \frac{7x-1}{3} = \frac{x-6}{2}$ d) $\frac{2x-5}{20} - \frac{5x-3}{5} = \frac{x+1}{4} - 1$ f) $\frac{3(x-5)}{12} - \frac{4(2-3x)}{6} = 1 + \frac{x}{18}$ |
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Exercise 5: Solve the following equations:

a) $\frac{x-2}{5} = \frac{3-7x}{4}$

b) $\frac{5}{3x-8} = \frac{7}{x-9}$

c) $\frac{5x-1}{3x-2} = \frac{5}{7}$

d) $\frac{x-2}{35} = \frac{7-3x}{32}$

e) $\frac{10x-7}{x+8} = \frac{1}{2}$

f) $\frac{3(2x-7)}{2} = \frac{5(1-3x)}{3}$

Exercise 6: The quadruple of a number minus sixteen equals the triple of that number plus seven. Find the number.

Exercise 7: If I add a number and its consecutive the answer is four hundred and ninety-one. Which numbers are they?

Exercise 8: The triple of the consecutive of a number equals the four times that number minus fourteen. Find the number.

Exercise 9: If I subtract thirteen from a number and then I divide the result by seven, the answer is nine. What is the number?

Exercise 10: In an isosceles triangle the base is fifteen cm longer than the other two equal sides and the perimeter is seventy-two cm. Find its dimensions.

Exercise 11: In the Olympic Pool used for the European games in 2015, the length doubles the width. If the perimeter measures 500 feet, find the dimensions of the pool in meters and check the result knowing that 1 foot is equivalent to 0.3 m.

Exercise 12: Six years ago John was four times as old as his son Henry, but nowadays John's age only triples Henry's. How old are they?

Exercise 13: Mary is 26 years younger than her mother Lily, but seven years ago Lily was twice as old as Mary. How old are they now?

Exercise 14: A kilo of strawberries is 1.5€ more expensive than a kilo of kiwis. If I buy 2 kilos of kiwis and 3 kilos of strawberries to prepare a fruit salad for dessert, I will have to pay 13.25€. Find the price of each product.

Exercise 15: I have a lot of plants in my house. Half of them are succulents, the sixth part are dracaenas, the sixteenth part are spathiphyllums, the twelfth part are calla lilies and I also have eleven more plants of some other genus. How many plants are there in my house?

Exercise 16: A farmer plants a fifth of his farm with potatoes, two thirds with pepper and the rest, 300 m^2 , with onions. What's the total area of the farm?

Exercise 17: Solve the following quadratic equations:

a) $2x^2 - 50 = 0$

b) $7x^2 + 28x = 0$

c) $3x^2 - 507 = 0$

d) $14x^2 + 7x = 0$

e) $5x^2 - 30x = 0$

f) $3x^2 - 51 = 0$

g) $8x^2 - 2 = 0$

h) $9x^2 + 72x = 0$

i) $9x^2 - 49 = 0$

j) $121x^2 - 1 = 0$

Exercise 18: Solve the following second degree equations:

a) $x^2 + 2x - 15 = 0$

b) $x^2 + 9x + 8 = 0$

c) $x^2 - 2x + 1 = 0$

d) $x^2 - 10x + 16 = 0$

e) $x^2 - 3x + 6 = 0$

f) $2x^2 - 16x + 14 = 0$

g) $3x^2 + 7x + 2 = 0$

h) $x^2 - 14x + 49 = 0$

i) $x^2 - 3x + 10 = 0$

j) $9x^2 - 6x + 1 = 0$

Exercise 19: Solve these equations:

a) $(x-1)^2 = 0$

b) $(x-3)^2 = 4$

c) $(x-2)(x+1) = 0$

d) $(x-5)(2x+7) = 0$

e) $(x+7)^2 = 1$

f) $(5x-1)^2 = 0$

g) $(x-5)^2 = 9$

h) $(x+4)^2 = 25$

Exercise 20: The sum of a number and its square is twelve. Find the number.

Exercise 21: The product of a number and its consecutive is 306. Find the numbers.

Exercise 22: The length of a rectangular garden is 6m more than the width, and the area is 27m^2 . Find the dimensions of the garden.

Exercise 23: A rectangle is four as long as it is wide. Its area is 9m^2 . What are its dimensions?

Exercise 24: In an isosceles triangle the length of the altitude is 7 cm longer than the length of the base and the area is 130 cm^2 . Find the dimensions of the triangle.

Exercise 25: In a triangle, the length of the base is 5m less than the length of the altitude and the area is 102m^2 . Find the length of the base.

Exercise 26: Solve the following equations:

a) $(2x-3)^2 = 8x$

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

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

g) $(x-8)^2 = 49$

b) $(4x-1)(x+1) = 6$

d) $(2x-1)^2 + (3-x)^2 = 25$

f) $(x+7)^2 + 6x = 30$

h) $(2x-8)^2 = 36$

Exercise 27: Solve:

a) $(3x+6)^2 = 81$

c) $\frac{(x+3)^2}{25} = \frac{(x-5)^2}{9}$

e) $(x-3)^2 - 2 = 2x$

g) $\frac{x}{4} = \frac{x^2+2}{7x+2}$

b) $(x-2)^2 = \frac{4x-2}{2}$

d) $(3x-7)^2 - (2x-3)(2x+3) = -6$

f) $\frac{x^2-6}{5} = \frac{x^2+6}{7}$

h) $(x-9)(x+4) = -22$