ESERCITAZIONE
MATEMATICA GENERALE
CLEMIF

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20/09/2017, A.A. 2017/2018

EQUAZIONI

1) Risolvi le seguenti equazioni:

1. $10x - 1 = 15 - 6x$;

2. $\frac{3x}{2} + 5 = \frac{5x}{2} - 1$;

3. $\frac{x}{2} + \frac{x}{3} = 5$;

4. $7 + \frac{x}{3} = 8 + \frac{x}{4}$;

5. $x - \frac{2}{3} = \frac{5x}{7} + \frac{1}{2}$;

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

7. $3 - y + \frac{5y}{6} = \frac{1}{2} - \frac{y}{8}$;

8. $1.2 - \frac{x}{1.2} + 4.5x - \frac{x}{4.5} = 5.6 + x$;

9. $\frac{5}{3}(e - 6) = \frac{e}{7} + 22$;

10. $2a - (8a + 1) - 5(a + 2) = 9$;

11. $\frac{3}{8}[10(x - 5) + x] = 4x - \frac{6}{4}$;

12. $\frac{5x}{9} - \frac{4}{15} = \frac{2x-1}{3}$;

13. $-1 - 5[2x - 8(2x - 3)] = 19$;

14. $(x + 2)(x - 3) = (x - 5)(x - 6)$;

15. $(2x - \frac{3}{2})(x - 1) = (2x - 1)(x - \frac{5}{2})$;

16. $(6x - 5)(x - 2) - (3x - 1)(2x - 3) = 4$;

17. $(x + 2)(x - 2) - (x - 3)^2 = -1$;

18. $x - 4[x - 2(x + 6)] = 5x + 3$;

19. $(x - 3)(x + 4) - 2(3x - 2) = (x - 4)^2$;

20. $(x + 5)(x + 2) - 3(4x - 3) = (x - 5)^2$;

21. $2x^2 - 18 = 0$;

22. $(2x - 3)^2 = x(x - 12) + 12$;

23. $(x - 3)(x + 3) + 5x = 5(x - 5)$;

2) Risolvi le seguenti equazioni con variabili al numeratore e denominatore:

1. $\frac{1}{x+1} = \frac{1}{2x}$;

2. $\frac{x-4}{x-8} = 5$;

3. $\frac{3}{x-5} + 2 = \frac{5}{5-x}$;

4. $\frac{12-7y}{y-1} = \frac{4}{y+1} - 7$;

5. $\frac{4}{x-3} - \frac{3}{x-2} = \frac{1}{x-4}$;

6. $1 - \frac{5}{2y+6} = \frac{3}{y+3}$;

7. $\frac{z-5}{z} + \frac{3z+1}{z-3} = 4$;

3) Risolvi le seguenti equazioni con parametro $a \in \mathbb{R}$:

1. $5x - a = ax + 4$;

2. $\frac{x-a}{x-3} = 2a$;

3. $\frac{x-a}{x+1} = a$;

4. $\frac{3}{x+4} = \frac{a+1}{2a}$;

5. $\frac{x+a}{a} = ax - 1$;

6. $\frac{x-a}{1-x} = \frac{x+a}{1+a}$;

DISEQUAZIONI

4) Risolvi le seguenti disequazioni:

1. $5(x-1) + 7 \leq 1 - 3(x+2)$;

2. $4(x+8) - 7(x-1) < 12$;

3. $\frac{15(x-4)}{2} < 1 + 6x$;

4. $12x - 1 \leq 3(4x-3)$;

5. $\frac{3x-1}{-4} \leq 8 - \frac{x+3}{-6}$;

6. $x(x-4) - x^2 > 12 - 6x$;;

7. $\frac{x-4}{2} < \frac{7x}{2} - (3x+2)$;

8. $(x-1)(x-2) \geq (x-3)(x+1)$;

9. $4(x^2+1) + 8(3x-4) > 4x^2$;

10. $5(x-4)+17-14x > 13-4x$;

11. $x^2 - x - 6 \geq 0$;

12. $\frac{6}{7} - \frac{x}{2} > \frac{3}{7}x + \frac{39}{14} - x$;

13. $\left(x + \frac{10}{3}\right)\left(x + \frac{19}{3}\right) > \left(3x + \frac{46}{3}\right)\left(\frac{x}{3} + 1\right)$;

14. $\frac{10x-5}{2x-4} < 0$;

15. $\frac{(x+3)(x+5)}{x+2} \geq 0$;

16. $\frac{4x+3}{2x-5} > 0$;

17. $\frac{6x-5}{4x+1} \leq 0$;

18. $\frac{x^2-9}{x+3} \leq 0$

19. $\frac{x^2-4}{x^2-1} \leq 0$;

20. $\frac{x^2-1}{-x^2+2x-1} \leq 0$;

21. $\frac{x^2+3x+2}{x^2-16} \geq 0$;

22. $\frac{x^2+4x+3}{x-1} > 0$;

23. $\frac{x^2-16}{(x-1)^2} < 0$;

24. $\frac{x^2+5x+6}{x^2-4x-5} \leq 0$;

25. $\frac{3x+1}{x+4} \geq 1$;

26. $\frac{x-8}{x} \leq 3 - x$;