Math 0 test

FCS UNIPI - Math

Friday, September 5th, 2025

1. Compute $15/18 - 6/16$. $\boxed{11/24}$
2. Is it true that $\sqrt{2} + 2 + \sqrt{3} > 1 + \sqrt{5}$? $\boxed{\text{True}}$
3. Compute $\left(2\sqrt{2} + \frac{\sqrt{3}}{\sqrt{6}}\right)^2$. $\boxed{\frac{25}{2}}$
4. Solve, considering existence conditions, the equation
$$\frac{x\sqrt{x^2+1}}{x^2} = 0 \qquad \boxed{\emptyset}$$
5. Simplify $\dfrac{a^2 - b^2 + a - b}{a - b}$ $\boxed{a + b + 1}$
6. Find the greater common divisor and the least common multiple of the integers $105, 110$. $\boxed{5, 2310}$
7. Solve $27x - 18 = 0$. $\boxed{x = \frac{2}{3}}$
8. Solve $x^2 - x - 6 = 0$. $\boxed{x = -2, 3}$
9. Solve $5 - 3x > x$. $\boxed{x < \frac{5}{4}}$
10. Solve $x^2 - x - 6 < 0$. $\boxed{-2 < x < 3}$
11. Solve, considering existence conditions, $\dfrac{x+2}{x-1} \leq 0$. $\boxed{x \in [-2, 1)}$
12. Simplify $\dfrac{x^2 - 2x - 15}{x^2 - 4x - 21}$. $\boxed{\frac{x-5}{x-7}}$
13. Draw on the Cartesian plane the line for $A : (1, 1)$, $B : (1, 3)$.
14. Draw on the Cartesian plane the parabola $f(x) = x^2 + 4x - 5$.

15. Simplify and calculate

$$\left[\left(2-\frac{3}{4}\right)\cdot\frac{6}{15}\right]\cdot\frac{1}{2}+\left(\frac{1}{2}+\frac{3}{8}\right)-\left(\frac{7}{6}-\frac{9}{8}\right)$$

$\boxed{13/12}$

16. Draw on the Cartesian plane the triangle ABC, where $A=(0,0)$, $B=(0,2)$, $C=(1,0)$. Find the area and the perimeter of the triangle. $\boxed{1, 3+\sqrt{5}}$

17. Draw on the Cartesian plane the triangle ABC, where $A=(-1,2)$, $B=(0,5)$, $C=(2,2)$. Find the area and the perimeter of the triangle. $\boxed{9/2, 3+\sqrt{10}+\sqrt{13}}$

18. Solve, considering existence conditions, the inequality

$$\frac{1}{x+1}\geq\frac{1}{x^2+1} \qquad \boxed{x\in(-1,0]\cup[1,+\infty)}$$

19. Compute the area and perimeter of the circle with center in C : $(0,2)$ and that intersects the line $x=0$ at the origin O : $(0,0)$. $\boxed{A=4\pi, P=4\pi}$

20. Put in rational standard form $\dfrac{\sqrt{2}}{3-\sqrt{2}}$. $\boxed{\frac{2+3\sqrt{2}}{7}}$

21. Given the function $f(x)=\sqrt{x^2-1}$, find $f(1)$ and $f^{-1}(0)$. $\boxed{0, \{\pm 1\}}$

22. Solve, considering existence conditions, the equation

$$\frac{x^3-x^2-16x+16}{x-4}=0 \qquad \boxed{1, -4}$$

23. Find the greater common divisor and the least common multiple of the polynomials x^2-1, x^2+3x+2. $\boxed{x+1, x^3+2x^2-x-2}$

24. Solve graphically the inequality $2^x+x-1>0$. $\boxed{x>0}$

25. Put in rational standard form $\dfrac{1}{1+\sqrt[3]{3}}$. $\boxed{\frac{1-\sqrt[3]{3}+\sqrt[3]{9}}{4}}$