Math0 pre test test

FCS UNIPI - Math classes

$\boxed{\text{True}}$

1. Is it true that 11413 is prime ? $\boxed{\text{No}}$
2. Compute $(x+2)^4$. Sol: $\boxed{x^4+8x^3+24x^2+32x+16}$
3. Solve, considering existence conditions, the equation
$$\frac{2x-1}{(x)^2\sqrt{x^4+1}}=0$$
$\boxed{x=1/2}$
4. Solve, considering existence conditions, the inequality
$$\frac{2x-1}{x^2\sqrt{x^4+1}}>0$$
$\boxed{x>1/2}$
5. Solve, considering existence conditions, the equation
$$\frac{3x^3-5x^2-6x+10}{x^2-4}=0$$
$\boxed{x=5/3}$
6. Solve, considering existence conditions, the inequality
$$\frac{3x^3-5x^2-6x+10}{x^2-4}<0$$
$\boxed{x<5/3,\ x\neq 2}$
7. Simplify the fraction $\dfrac{a^5-b^5}{a-b}$. $\boxed{a^4+a^3b+a^2b^2+ab^3+b^4}$
8. Find the greater common divisor and the least common multiple of the integers $2185, 3335$. $\boxed{115, 63365}$

9. Perform the division $x^4 + x^3 + 2x - 3$ by $x^2 + x$.

   $\boxed{\text{Quotients} = x^3 + x^2 - 2x + 1, \text{ Remainder} = x - 2}$

10. Find the greater common divisor of the polynomials

$$x^3 - x^2 - 14x + 24, \quad x^3 - 12x^2 + 47x - 60$$

    $\boxed{x - 3}$

11. Solve the inequality $-4x^2 - 2x + 1 > 0$. $\boxed{x \in (\frac{-2-\sqrt{5}}{4}, \frac{-2+\sqrt{5}}{4})}$

12. Draw on the Cartesian plane x, y the parabola $\gamma : \ y = -x^2 + 2x + 2$.

13. Draw on the Cartesian plane x, y the circle $\gamma : \ x^2+y^2-2x-4y+1 = 0$.
    $\boxed{C : (1, 0), \quad r = 1}$

14. Given the function $f(x) = x^2 - 3$, find $f(2)$ and $f^{-1}(1)$. $\boxed{1, \{\pm 2\}}$

15. Put in rational standard form the fraction $\dfrac{\sqrt{5}}{\sqrt{5} + \sqrt{3}}$. $\boxed{\frac{\sqrt{10}-5}{2}}$