

Math 0 First Lesson Classwork

FCS UNIP1 – Math0 (Caboara)

1. Without using a calculator, determine which of the two numbers is larger:

$$2\sqrt{5} \quad \text{or} \quad \sqrt{21}.$$

2. Solve, considering existence conditions, the equation

$$\frac{1}{\sqrt{x-2}} = 3.$$

3. Simplify

$$\frac{2x^2 + 3x - 2}{x + 2}.$$

4. Draw on the Cartesian plane the parabola $f(x) = -x^2 + 4x + 5$.

5. Put in rational standard form

$$\frac{\sqrt{18}}{3 - \sqrt{2}}.$$

6. Solve, considering existence conditions, the inequality

$$\frac{x^2 - 9}{x - 3} > 0.$$

Answers

- $\sqrt{21}$ is larger: $(2\sqrt{5})^2 = 20 < 21 = (\sqrt{21})^2$.
- Domain: $x > 2$ (the square root sits in a denominator, so it must be strictly positive).
Squaring, $x - 2 = \frac{1}{9}$, so $x = \frac{19}{9}$ (valid, since $\frac{19}{9} > 2$).
- $2x - 1$, for $x \neq -2$ (numerator factors as $(2x - 1)(x + 2)$).
- Downward-opening parabola; roots $x = -1$, $x = 5$; vertex $(2, 9)$; y -intercept $(0, 5)$.
- First simplify $\sqrt{18} = 3\sqrt{2}$, then rationalize: $\frac{3\sqrt{2}}{3 - \sqrt{2}} \cdot \frac{3 + \sqrt{2}}{3 + \sqrt{2}} = \frac{9\sqrt{2} + 6}{7}$.
- Domain $x \neq 3$. For $x \neq 3$ the expression has the same sign as $x + 3$ (since it equals $x + 3$ there). So the inequality becomes $x + 3 > 0$, i.e. $x > -3$, excluding $x = 3$: solution $x \in (-3, 3) \cup (3, +\infty)$.