

Information test (not for evaluation) from high school Mathematics

full name:

1. simplify the expression: $\frac{a^2-6a+9}{a^2+3a} \cdot \frac{a+3}{a-3}$,
write down the conditions of existence.

$$\dots \frac{a-3}{a}; a \in \mathbb{R} - \{-3; 0; 3\}$$

2. In domain \mathbb{R} solve the equation:

$$\frac{4}{3y} - \frac{1}{6} = \frac{2}{y}$$

$$\dots y = -4$$

3. For $x \in \mathbb{R}$ solve: $|x - \frac{1}{2}| < \frac{3}{2}$,
write the result as an interval.

$$\dots x \in (-1; 2)$$

4. Determine V , if $\ln V = \ln(x+5) - 2 \ln(3-x)$.
Find $x \in \mathbb{R}$ such that the expression $\ln V$ is defined.

$$\dots V = \frac{x+5}{(3-x)^2}; x \in (-5; 3)$$

5. Write down the domain of definition $D(f)$ of function
 $f(x) = \ln(x^2 - 9)$, write the result as an interval.

$$\dots x \in (-\infty; -3) \cup (3; \infty)$$

6. In domain \mathbb{R} solve the equation:

$$\frac{1}{\sqrt{2x+7}} - 1 = 0$$

$$\dots x = -3$$

7. In domain \mathbb{R} solve the equation:

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

$$\dots x \in \{2; -1/2\}$$

8. Given equation: $\sin^2 x - \sin x = 0$.
Find all solutions in the interval $\langle 0, \pi \rangle$.

$$\dots x \in \{0; \pi/2; \pi\}$$

9. Determine the intersection $P = [x, y]$ for the lines p and q .
 $p: x - 2y - 3 = 0, q: 3x - 4y - 8 = 0$

$$\dots P = [2; -1/2]$$

10. Write the complex number $z = (3 - 2i) - (2 - 5i)^2$
in the form $a + bi$

$$\dots z = 24 + 18i$$