

12. Q.L-algebra · Algebra: domains, systems, inequalities and functions

Starter Quiz ·

GRE General Test

Name: _____ Score: _____

1. Over the real numbers, how many solutions does $\frac{x^2 - 9}{x - 3} = 6$ have?

- ☐ One
- ☐ Infinitely many
- ☐ Two
- ☐ None

2. If $2x + y = 11$ and $x - y = 1$, what is x ?

3. Solve $-2x + 5 > 1$.

- ☐ $x < -2$
- ☐ $x > 2$
- ☐ $x < 2$
- ☐ $x > -2$

4. If $f(x) = 3x - 2$ and $g(x) = x^2$, what is $f(g(2))$?

5. Cancelling a common factor removes the original restriction on x .

- ☐ True ☐ False

6. What is the real solution set of $\frac{x^2 - 4}{x - 2} = x + 2$?

- ☐ No solutions
- ☐ Only 2
- ☐ All real numbers except 2
- ☐ All real numbers

7. Select every offered real solution of $\sqrt{x + 6} = x$.

- ☐ 6
- ☐ -3
- ☐ 3
- ☐ 0

☐ -2

Tick every correct option.

8. How many real ordered-pair solutions satisfy both $x + y = 10$ and $2x + 2y = 20$?

☐ Infinitely many

☐ Exactly one

☐ Exactly two

☐ None

9. Select every offered real value satisfying $-3 < 2x + 1 \leq 7$.

☐ -2

☐ -1.5

☐ 3

☐ 0

☐ 3.1

Tick every correct option.

10. For $f(x) = x^2 - 3$, which expression equals $f(a + 1)$ for every real a ?

☐ $a^2 - 2$

☐ $a^2 - 3$

☐ $a^2 + 2a - 2$

☐ $a^2 + 1$

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Answers ·

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1. None

The original expression excludes $x = 3$. For $x \neq 3$, factoring and cancelling gives $x + 3 = 6$. Its only candidate is 3, which is excluded, so there are no solutions.

2. 4

Adding the original equations gives $3x = 12$, so $x = 4$. Substitution gives $y = 3$; both $2(4) + 3 = 11$ and $4 - 3 = 1$ hold.

3. $x < 2$

$-2x > -4$; dividing by -2 reverses: $x < 2$.

4. 10

$g(2) = 4$; $f(4) = 10$.

5. False

Cancelling a factor is valid only where that factor is nonzero. The simplified formula cannot admit an input excluded by the original denominator.

6. All real numbers except 2

For $x \neq 2$, the factored numerator cancels to $x + 2$, making an identity. The original denominator still excludes 2.

7. 3

Squaring yields candidates 3 and -2 , but the original square root is nonnegative. At -2 its value is 2, not -2 . Only 3 works.

8. Infinitely many

The second equation is twice the first. All real pairs with $y = 10 - x$ work, so there are infinitely many.

9. -1.5 ; 3; 0

The equivalent interval is $-2 < x \leq 3$. Select -1.5 , 0 and 3; the lower endpoint -2 and the value 3.1 fail.

10. $a^2 + 2a - 2$

Substitute the whole input: $(a + 1)^2 - 3 = a^2 + 2a - 2$.