

Diagnostic Review – Units 7, 8

The Math Diagnostic Sequence at the College of Western Idaho involves testing out of Units for Math 095. The diagnostic tests have between 10 and 20 questions. If you complete a test with a passing score you can attempt the next test in the sequence.

Units 7, 8 – Quadratic Equations, Relations & Functions, and Function Notation

Topics and Exaples:

1. Topic: Solve quadratic equations by factoring
 - Example: Solve $x^2 - 12x + 32 = 0$
2. Topic: Use the square root property to solve quadratic equations
 - Example: Solve $(x + 4)^2 = 25$
3. Topic: Use the quadratic formula to solve equations
 - Example: Solve $5x^2 + 2x - 2 = 0$
4. Topic: Find the domain and range of a relation and determine whether it is a function
 - Example: $\{(4, 5), (6, 3), (2, 8), (4, 7), (5, 5)\}$
5. Topic: Evaluate a function
 - Example: If $f(x) = (x - 8)^2 - x$, find $f(4)$.
6. Topic: Find the domain of a function
 - Example: $g(x) = \frac{6x+7}{\sqrt{3x-8}}$
7. Topic: Application involving projectile motion
 - Example: A rock is thrown straight up from a cliff that is 24 feet above water. If the height of a rock h , in feet, after t seconds is given by the equation $h = -16t^2 + 20t + 24$, how long will it take for the rock to hit the water?
8. Topic: Simplify rational expressions
 - Example: $\frac{6x^2+11x-10}{6x^2+7x-20}$
9. Topic: Multiply/Divide rational expressions
 - Example: Multiply $\frac{2x^2-8}{18x} \cdot \frac{12x}{5x+10}$
10. Topic: Add/Subtract rational expressions
 - Example: Subtract $\frac{12x^2-5x}{2x^2-4x-6} - \frac{7x}{2x+2}$

11. Topic: Simplify complex rational expressions

- Example: Simplify $\frac{\frac{1}{4} - \frac{1}{x^2}}{\frac{1}{x} + \frac{1}{2}}$

12. Topic: Find restricted values for rational expressions

- Example: $\frac{x+4}{x^2-x-30}$

13. Topic: Solve rational equations

- Example: Solve $\frac{5}{x-2} = 7 - \frac{10}{x+2}$

Answers:

Units 7, 8 – Quadratic Equations, Relations & Functions, and Function Notation

1. $x = 4, 8$
2. $x = -9, 1$
3. $x = -\frac{1}{5} \pm \frac{\sqrt{11}}{5}$
4. Domain $\{2, 4, 5, 6\}$, Range $\{3, 5, 7, 8\}$, Not a function
5. $f(4) = 12$
6. $x > 2\frac{2}{3}$
7. 2 seconds
8. $\frac{3x-2}{3x-4}$
9. $\frac{4(x-2)}{15}$
10. $\frac{x(5x+16)}{2(x-3)(x+1)}$
11. $\frac{x-2}{2x}$
12. restricted values: $x = -5, 6$
13. $x = -\frac{6}{7}, 3$

Some websites to help you practice are:

- IXL <https://www.ixl.com/math/algebra-1>
- S.O.S Math <http://www.sosmath.com/algebra/algebra.html>
- Khan Academy <https://www.khanacademy.org/math/algebra?t=practice>
- Purplemath <http://www.purplemath.com/>