

Diagnostic Review – Units 0, 1, 2

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 0, 1, 2 – Basic Geometry, Measurement, Basic Statistics, Algebraic Expressions and Linear Equations

Topics for Unit 0,1,2 Diagnostic Test	Examples
Write whole numbers in standard form	1. Three hundred fifty-six thousand nine hundred eighty-three
Solve perimeter and area applications with real numbers	2. Find the perimeter and area of a rectangle with a width of 12 cm and a length of 17 cm
Round decimal numbers to a given place value	3. Round 874.0398 to the nearest hundredth
Find the mean, median and mode	4. Find the mean of 2, 6, 8, 3, 5, 2
Multiply/Divide integers	5. $-3(6)(-5) \div 9$
Add/Subtract integers	6. Subtract: $-12 - (-3)$
Multiply/divide fractions	7. Multiply: $\frac{1}{2} \left(-\frac{6}{7}\right) \left(-\frac{5}{8}\right)$
Add/subtract fractions	8. Subtract: $-\frac{5}{6} - \frac{3}{8}$
Simplify expressions with real numbers using order of operations	9. $-5 + 4[5 - 4(1 - 4)^2]$
Evaluate algebraic expressions	10. $\frac{-2x-6}{x-4}$
Use distributive property	11. $4(2y - 5)$
Simplify an algebraic expression and combine like terms	12. $-3(x - 8) + 2x - (6x - 4)$
Translate a word phrase into an algebraic expression	13. Three more than twice the sum of a number and 20
Solve equations by using both the addition and multiplication properties	14. $2x + 5 = 17$
Solve linear equations containing parentheses	15. Solve $4(2x - 5) = 6(x + 2) - 10$
Solve equations containing fractions	16. Solve $\frac{1}{2}x + 8 = \frac{3}{5}x - \frac{7}{10}$
Solve equations containing decimals	17. Solve $-6.8y + 4.26y = 13.3 - 6.34y$
Solving word problems by adding, subtracting, multiplying or dividing integers	18. If there is \$56 in a savings account and a deposit of \$40 is made and a withdrawal of \$18 is made, how much remains in the account?
Solve an absolute value equation	19. Solve $ x = 21$

Solve a formula for a specified variable	20. Solve $A = \frac{1}{2}bh$ for h
Evaluate a formula	21. Find the value of t if $I=Prt$, $I = \$1560$, $P = \$13,000$, $r = 0.03$
Evaluate exponential expressions	22. $\left(-\frac{2}{3}\right)^3$

Answers:

Units 0, 1, 2 – Geometry, Intro to Algebra, Linear Equations, Probability and Statistics

1. 356,983	2. 58	3. 874.04	4. $4.\bar{3}$ or $4\frac{1}{3}$	5. 10
6. -9	7. $\frac{15}{56}$	8. $-\frac{29}{24}$	9. -129	10. $-\frac{13}{3}$
11. $8y - 20$	12. $-7x + 28$	13. $3+2(x+20)$	14. $x = 6$	15. $x = 11$
16. $x = 87$	17. $y = 3.5$	18. \$88	19. $\{-21, 21\}$	20. $h = \frac{2A}{b}$
21. $t = 4$ years	22. $-\frac{8}{27}$			

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>

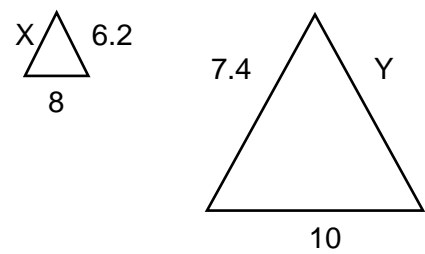
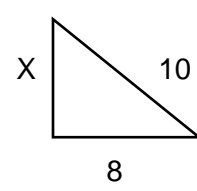
Khan Academy <https://www.khanacademy.org/math/algebra?t=practice>

Purplemath <http://www.purplemath.com/>

Diagnostic Review – Units 3, 4

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 3, 4 – Ratios, Unit Rates, Proportions, Slopes, Lines and Graphs

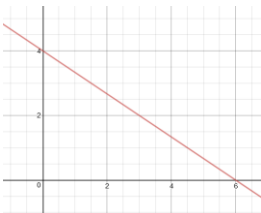
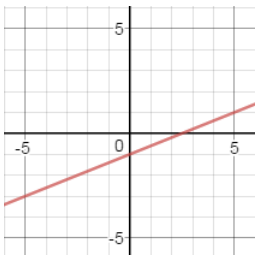
Topics for Unit 3,4 Diagnostic Test	Examples
Find a unit rate	1. Mary earned \$4420 for 13 weeks of summer work. What was her unit rate in dollars per week?
Solve a proportion	2. Solve $\frac{5}{12} = \frac{y}{30}$
Use a proportion in problem solving	3. A worker can complete the assembly of 16 cell phones in 4 hours. At this rate, how many can the worker complete in a 40-hour work week?
Find the unknown length of sides in similar triangles	4. Find the length of X and Y. <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;">  </div>
Use the Pythagorean Theorem	5. Find the length of the missing side. <div style="display: flex; justify-content: center; align-items: center; margin-top: 10px;">  </div>
Solve percent problems	6. What is 35% of 105?
Solve percent problems using proportions	7. 25.6 is what percent of 80?
Solve percent problems involving sales tax	8. If the sales tax rate increases from 5% to 6.5%, how much more will a person have to pay for an \$18 book?
Graph by completing ordered pairs	9. Graph; $y = -\frac{2}{3}x + 4$
Find intercepts of a given equation	10. Find intercepts; $2x + 8y = -12$
Find the slope of a given equation	11. Find slope; $5x - 4y = 16$

Using the slope and y-intercept of a given equation, graph the line	12. Graph; $y = \frac{2}{5}x - 1$
Write the equation of the line containing a given pair of points	13. Find the line given; (3, 5) and (-9, 10)
Write the equation of a line given a point and the slope	14. Find the line given; point (2, -6) and slope = $-\frac{3}{4}$

If you only need Math 123 Math in the Modern Society (fulfills the GEM requirement of a Mathematical course), you need to finish Units 1 – 4.

Answers:

Units 3, 4 – Ratios, Unit Rates, Proportions, Slopes, Lines and Graphs

1. \$340 per week	2. $y = 12.5$	3. 160	4. $X = 5.92, Y = 7.75$
5. $x = 3$	6. 36.75	7. 32%	8. \$0.27
9. 	10. $(0, -\frac{3}{2})$ and $(-6, 0)$	11. slope = $\frac{5}{4}$	12. 
13. $y = -\frac{5}{12}x + 6\frac{1}{4}$	14. $y = -\frac{3}{4}x + 4\frac{1}{2}$		

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Diagnostic Review – Units 5, 6

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 5, 6 – Exponents, Polynomials, and Factoring

Topics for Unit 5,6 Diagnostic Test	Examples
Simplify polynomials by combining like terms	1. $4xy + 5y - 7x + 9y + 2xy - 19$
Subtract polynomials	2. $(-7x^2 + 8x - 12) - (x^2 - 5)$
Multiply two binomials by using FOIL	3. $(5x - 8)(10x + 4)$
Multiply two or more polynomials	4. $3x(2x - 4)(5x - 3)$
Square a binomial sum	5. $(3x + 5)^2$
Add/Subtract polynomials in several variables	6. $(3x^2 - 4xy + 7y^2) - (4x^2 - 6xy + 10y^2)$
Multiply polynomials in several variables	7. $(6x - 2y)(x + 4y)$
Factor out the greatest common factor from a polynomial	8. $30y^3 - 20y^2 + 10y$
Factor by grouping	9. $12y^2 - 6y + 10y - 5$
Factor trinomials	10. $x^2 - 3x - 18$
Factor polynomials	11. $5x^2 - 13x - 6$
Factor the difference of two squares	12. $25q^2 - 81$
Factor polynomials completely	13. $5x^2 - 35x + 60$
Use the rules of exponents to simplify an expression	14. $(m^3n^2)^3(-m^2n^5)^2$
Use the rules of exponents to simplify a rational expression	15. $\frac{(ab^5)^{-6}}{a^{10}b^{-5}}$

If you only need Math 153 Elementary Statistics, you need to finish Units 1 – 6.

Answers:

Units 5, 6 – Exponents, Polynomials, and Factoring

1. $6xy - 7x + 14y - 19$	2. $-8x^2 + 8x - 7$	3. $50x^2 - 60x - 32$	4. $30x^3 - 78x^2 + 36x$
5. $9x^2 + 30x + 25$	6. $-x^2 + 2xy - 3y^2$	7. $6x^2 + 22xy - 8y^2$	8. $10y(3y^2 - 2y + 1)$
9. $(6y + 5)(2y - 1)$	10. $(x - 6)(x + 3)$	11. $(5x + 2)(x - 3)$	12. $(5q + 9)(5q - 9)$
13. $5(x - 3)(x - 4)$	14. $m^{13}n^{16}$	15. $\frac{1}{a^{16}b^{25}}$	

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Diagnostic Review – Units 7, 8

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

Topics for Unit 7,8 Diagnostic Test	Examples
Solve quadratic equations by factoring	1. Solve $x^2 - 12x + 32 = 0$
Use the square root property to solve quadratic equations	2. Solve $(x + 4)^2 = 25$
Use the quadratic formula to solve equations	3. Solve $5x^2 + 2x - 2 = 0$
Find the domain and range of a relation and determine whether it is a function	4. $\{(4, 5), (6, 3), (2, 8), (4, 7), (5, 5)\}$
Evaluate a function	5. If $f(x) = (x - 8)^2 - x$, find $f(4)$.
Find the domain of a function	6. $g(x) = \frac{6x+7}{\sqrt{3x-8}}$
Application involving projectile motion	7. 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?
Simplify rational expressions	8. $\frac{6x^2+11x-10}{6x^2+7x-20}$
Multiply/Divide rational expressions	9. Multiply $\frac{2x^2-8}{18x} \cdot \frac{12x}{5x+10}$
Add/Subtract rational expressions	10. Subtract $\frac{12x^2-5x}{2x^2-4x-6} - \frac{7x}{2x+2}$
Simplify complex rational expressions	11. Simplify $\frac{\frac{1}{4} - \frac{1}{x^2}}{\frac{1}{x} + \frac{1}{2}}$
Find restricted values for rational expressions	12. $\frac{x+4}{x^2-x-30}$
Solve rational equations	13. 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. $x = -\frac{6}{7}, 3$		

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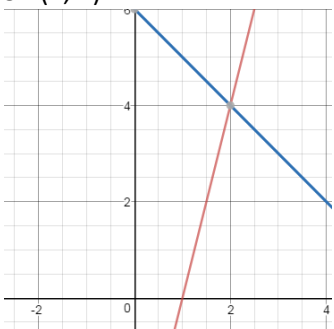
Diagnostic Review – Units 9, 10

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Units 9, 10 – Radical Functions and Systems of Linear Equations

Topics for Unit 9, 10 Diagnostic Test	Examples
Write an exponential expression as a radical expression	1. $(10x)^{2/5}$
Simplify a radical expressions	2. $\sqrt{75x^6y^5}$
Add/subtract radical expression	3. $4x\sqrt{2x^2y} - 5\sqrt{16x^5y} + \sqrt{4x^4y^2}$
Solve an equation involving one radical expression	4. $\sqrt{4x - 5} + 12 = 16$
Simplify radicals with negative radicands	5. Simplify $\sqrt{-18}$
Add/subtract complex numbers	6. $(6 - 10i) - (4 + 7i)$
Mult/Div complex numbers	7. $(3 - 4i)(5 + i)$
Determine whether a given ordered pair is a solution to a system of equations	8 Is $(3, -1)$ a solution to the system of equations? $\begin{cases} 7x + 2y = 19 \\ x - 4y = 7 \end{cases}$
Solve a system of equations by graphing	9. Solve by graphing $y = 4x - 4$ $y = -x + 6$
Solve a system of equations by substitution	10. Solve by substitution $3x + 6y = -6$ $x + y = 4$
Solve a system of equations by elimination	11. Solve by elimination $8x + y = -9$ $-4x + y = 3$
Solve a word problem by using a system of equations	12. Isaiah weighs 20 pounds more than his friend, Geoff. If the sum of their weights is 340 pounds, how much does each man weigh?

Answers: Units 9, 10 – Radical Functions and Systems of Linear Equations

1. $\sqrt[5]{100x^2}$	2. $5x^3y^2\sqrt{3y}$	3. $-6x^3\sqrt{2x^2y} + 2x^2y$	4. $x = 7$
5. $3i\sqrt{2}$	6. $2 - 17i$	7. $19 - 17i$	8. Yes
9. (2, 4) 	10. (10, -6)	11. (-1, 1)	12. Geoff weighs 160 pounds, and Isaiah weighs 180 pounds

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Diagnostic Review – Units 11, 12

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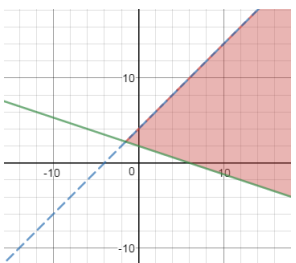

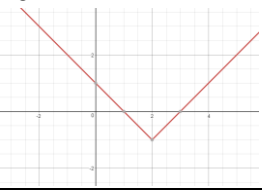
Units 11, 12 – Inequalities, Translations of Graphs, Exponential and Logarithmic Functions

Topics for Unit 11, 12 Diagnostic Test	Examples
Solve an inequality and graph it	1. Solve $10x - 5 \geq 2x + 11$
Solve three-part inequalities, and state answer in interval notation	2. Solve $-4 < 3 - 4x \leq 5$
Solve a compound inequality, and state answer in interval notation	3. Solve $6x - 3 > 9$ and $2x + 23 > 5x + 5$
Solve absolute value equation.	4. Solve $5 4x + 3 - 7 = 23$
Solve an absolute value inequality. Use interval notation.	5. Solve $ 2x + 5 + 4 \geq 13$
Solve a polynomial inequality. Use interval notation.	6. Solve $x^2 - 4x \leq -14x - 24$
Graph a system of inequalities	7. Graph $\begin{cases} y < x + 4 \\ 2x + 6y \geq 12 \end{cases}$
Graph a quadratic function	8. Graph $f(x) = -(x - 3)^2 - 2$
Find the vertex of a quadratic function	9. $f(x) = \frac{1}{2}x^2 + 2x + 4$
Graph an absolute value function	10. Graph $g(x) = x - 2 - 1$
Change an exponential equation into a logarithmic equation	11. $5^{-3} = \frac{1}{125}$
Solve an exponential equation	12. Solve $\sqrt{3} = 27^x$
Find the domain of a radical function. Use interval notation.	13. $f(x) = \sqrt{3x - 12}$
Evaluate a logarithmic expression	14. Evaluate $\log_4 64$
Form a composite function $(f \circ g)(x)$	15. Find $(f \circ g)(x)$ if $f(x) = x^2 + 5$ and $g(x) = \frac{1}{x}$

If you need Math 130 Discrete Math, Math 143 College Algebra, or Math 147 Precalculus (Math 143 and Math 147 are prerequisites to any Calculus courses)

Answers:

Units 11, 12 – Inequalities, Translations of Graphs, Exponential and Logarithmic Functions

1. 	2. $\left[-\frac{1}{2}, \frac{7}{4}\right)$	3. (2, 6)	4. $\left\{\frac{3}{4}, -\frac{9}{4}\right\}$
5. $(-\infty, -7] \cup [2, \infty)$	6. $[-6, -4]$	7. 	8. 
9. (-2, 2)	10. 	11. $\log_5\left(\frac{1}{125}\right) = -3$	12. $x = \frac{1}{6}$
13. $[4, \infty)$	14. 3	15. $(f \circ g)(x) = \left(\frac{1}{x}\right)^2 + 1$	

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