

MCR3U

Final Exam Review

1. What is the third term of the sequence: $t_n = n^2 + 3$. 1. _____
2. Find the next two terms of the sequence: 1, 8, 27, 64, ____, _____. 2. _____
3. Calculate the simple interest on borrowing \$500 at 12% for 3 years. 3. _____
4. True or False: The following sequence is geometric: 2, 8, 32, 128, ... 4. _____
5. What is the interest rate per period of an investment at 9%/a, compounded quarterly? 5. _____
6. Evaluate: $27^{\frac{-2}{3}}$ (No decimals) 6. _____
7. Simplify: $(16x^8)^{\frac{1}{4}}$ 7. _____
8. If $g(x) = 3x^2 - 2x + 1$, find $g(-2)$ 8. _____
9. Is the following set of ordered pairs a function? $\{(2,7), (3,5), (-2,5), (0,3)\}$ 9. _____
10. What is the inverse of the function $y = 2x + 1$? 10. _____
11. Evaluate: $-\sqrt{20}$ 11. _____
12. How many x-intercepts does the function $y = -(x - 3)^2 + 4$? 12. _____
13. Find the value of "d" that makes the following expression a perfect square:
 $x^2 + \frac{3}{2}x + d$ 13. _____
14. Using the discriminant, determine the number of zeros of the function,
 $y = 2x^2 + 4x - 3$ 14. _____
15. What are the next two positive, coterminal angles of 41° ? 15. _____
16. What is the principal angle of -187° ? 16. _____
17. What is the range of the cosine function. 17. _____
18. State the period of the function $y = 2 \sin 3\theta$ in degrees. 18. _____

19. Solve for θ : $\cos \theta = 0$, $0^\circ \leq \theta \leq 360^\circ$ 19. _____
20. What is the range of the function $y = 3 \sin \theta + 6$ 20. _____
21. What is the exact value of $\tan 60^\circ$? 21. _____
22. If a \$12000 car depreciates by 20% each year, what is its value after 6.5 years? 22. _____
23. What is the range of the function $y = 2(3)^x + 5$. 23. _____
24. What is the y-intercept of $f(x) = -5(\frac{1}{2})^x + 3$ 24. _____
25. What is the horizontal asymptote of $y = (1.5)^x + 9$ 25. _____
26. What is the domain of $y = 13(\frac{2}{7})^x - 2$ 26. _____
27. Is the above function increasing or decreasing? 27. _____
28. The value of a vase is given by $f(x) = 500(1.028)^x$ where x is the number of years and f(x) is the value.
What is the value of the vase today (original value)? 28A. _____
How much does it appreciate by each year? 28B. _____
29. Is $f(x) = -5^x$ increasing or decreasing? 29. _____

30. Evaluate: $\left(\frac{1}{36}\right)^{\frac{1}{2}}$ 30. _____
31. Evaluate: $16^{\frac{3}{4}}$ 31. _____
32. Evaluate: $(32)^{-\frac{3}{5}}$ 32. _____
33. Evaluate: $(3^2 \times 4)^{-1}$ 33. _____
34. Evaluate to **two decimal places**: $9.34^{\frac{-1}{5}}$ 34. _____
35. Simplify: $\left(\frac{\sqrt[4]{y^4}}{\sqrt{y^2}}\right)^3$ 35. _____
36. Express using only positive exponents: $\frac{9x^{-6}y^3}{6x^{-3}y^{-2}}$ 36. _____
37. Solve the following exponential equation: $4^x = \sqrt[3]{4}$ 37. _____
38. Solve the following exponential equation: $2^x = 2^{2x} \times 2^3$ 38. _____
39. Simplify: $\left[(2x^2 - 3x^2)^3 - 4x(2x + 5x^3)^{-4}\right]^0$ 39. _____
40. Simplify $(-2x^3 + 4x - 7) + (5x^3 - 12)$ 40. _____
41. Express $\sqrt{90}$ as a mixed radical. 41. _____
42. Express $5\sqrt{4}$ as an entire radical. 42. _____
43. Simplify: $2\sqrt{6} \times 3\sqrt{6}$ 43. _____
44. Simplify: $\sqrt{5x} \times \sqrt{4x}$ 44. _____
45. True or False: $\sqrt{a} + \sqrt{b} = \sqrt{a+b}$ 45. _____
46. Simplify: $3\sqrt{2} - 8\sqrt{2} + 4\sqrt{2}$ 46. _____
47. Simplify: $\sqrt{20} + \sqrt{5}$ 47. _____
48. Simplify: $(3 + 5\sqrt{7})(3 - 5\sqrt{7})$ 48. _____
49. Simplify: $(\sqrt{*} + \sqrt{*})^2$ 49. _____
50. What is the domain of the function $y = \sqrt{2x - 7}$ 50. _____
51. Determine the fifth term of the following sequence: $t_n = \frac{2n^2+5}{n+4}$ 51. _____
52. Find the next term of the following sequence: 41, 44, 39, 46, 37, 52. _____
53. Write the general term for the sequence 3, 15, 75, 375, ... 53. _____
54. Write the general term for -32, -11, 10, 31, ... 54. _____
55. Does the general term, $t_n = 3^{n+1}$, represent an arithmetic sequence, geometric sequence or neither? 55. _____
56. Does the general term, $t_n = (n+2)(n-3)$, represent an arithmetic sequence, geometric sequence or neither? 56. _____
57. Prove the following identity: $\sin x + \tan x = \tan x(1 + \cos x)$ 57. _____

58. Simplify using only positive exponents: $\frac{6x^{-2}y^3z}{15x^{-4}y^2}$ 58. _____
59. State the restrictions on the following expression: $\frac{2x^2 - 5}{3x^2(x + 7)}$ 59. _____
60. Simplify: $-\frac{-(a - b)}{-a + b}$ 60. _____
61. Simplify: $(2x^2 - 7x + 6) - (x^2 - 2x - 9)$ 61. _____
62. Expand and Simplify: $-6x(3x + 2) + 4x^2 - 7x + 11$ 62. _____
63. Expand and Simplify: $(x - 5)^2$ 63. _____
64. Is $(x - 6)^2 = (6 - x)^2$ 64. _____
65. Factor: $2ab + 2a - 3b - 3$ 65. _____
66. What is the equation of the vertical asymptote of $y = \frac{1}{2x - 5}$ 66. _____
67. At what coordinates is the hole for the graph $y = \frac{(x - 3)}{(x - 3)(x + 2)}$ 67. _____
68. State the vertex of $f(x) = 3x^2 - 6x + 5$. 68. _____
69. State the equation of a parabola with zeros -2 and 4 and y intercept of -16. 69. _____
70. Factor: $16a^2 - 4$ 70. _____
71. Factor: $x(x - 3) - 2(x - 3)$ 71. _____
72. Factor: $2n - 6m + 5n^2 - 15mn$ 72. _____
73. Factor: $3a^2 - 10a - 8$ 73. _____
74. What are the coefficients in the expansion of $(y - 1)^6$? 74. _____
75. What is the recursive formula for 3,5,2,-3,-5,-2,... 75. _____