

Unit 10 Assignments

Secondary 3 Honors

Assignment #10-1

Change each expression to either radical notation or rational exponent notation depending on its form.

1) $\sqrt[3]{7x}$ 2) $(\sqrt{6})^9$ 3) $14^{\frac{2}{5}}$ 4) $h^{\frac{7}{2}}m^{\frac{5}{2}}a^{\frac{11}{12}}$ 5) $\sqrt[3]{64a^7k^6p^{10}}$

Evaluate each expression without a calculator. Show your work!

6) $\sqrt[3]{-125}$ 7) $27^{\frac{2}{3}}$ 8) $(\sqrt[4]{16})^5$ 9) $2(\sqrt[6]{64})$

Simplify each expression. Leave all answers with positive exponents and in reduced radical form. Show work!!

10) $\sqrt{8} \cdot \sqrt{10} \cdot \sqrt{24}$ 11) $\frac{\sqrt{3}}{\sqrt{75}}$ 12) $g^{\frac{5}{3}}g^{\frac{3}{2}}$ 13) $4^5\sqrt{7} - 9^5\sqrt{7}$ 14) $\frac{11^{\frac{4}{5}}}{11^{\frac{1}{5}}}$ 15) $-3\sqrt{h}(5\sqrt{h} - 10\sqrt{h})$
16) $\sqrt{x^2yz^2} \cdot \sqrt{x^3z^5y^4}$ 17) $\sqrt{\frac{20x^3y^2}{9xz^3}}$ 18) $12^4\sqrt{2} - 7^4\sqrt{512}$ 19) $2^4\sqrt{1250} - 8^4\sqrt{32}$ 20) $w^5(6\sqrt{h^3w^4})^3$
21) $(3z^2k^{-5}r^{-6})^{\frac{1}{2}}$ 22) $\sqrt{x^3} \cdot \sqrt[3]{x^2}$ 23) $\left(\frac{-3d^2m^{-7}}{18d^{-9}m^4}\right)^{-2}$ 24) $(x^4y)^{\frac{1}{2}} + (xy^{\frac{1}{4}})^2$

25) Graph and label a full period: $y = -4\cos(2x - \pi)$

26) Find the other zeros of $f(x) = 2x^4 + 7x^3 - 4x^2 - 27x - 18$ if 2 is one of the zeros. Do not use a calculator!

27) Graph and label the domain, VA, HA, SA, hole, x-int, and y-int for the function $f(x) = \frac{x-3}{x^2-7x-8}$.

Assignment #10-2

Secondary 3 Honors

Solve each equation. Show your work and check your solutions!

1) $\sqrt[3]{x-2} - 10 = -3$ 2) $\sqrt{3x+10} = 8$ 3) $\sqrt{2x} - \frac{2}{3} = 0$ 4) $-2\sqrt{24x} + 13 = -11$ 5) $\sqrt[3]{12x} - 13 = -7$
6) $-5\sqrt[3]{8x} + 12 = -8$ 7) $\frac{1}{2}x^{\frac{5}{2}} = 16$ 8) $9x^{\frac{3}{5}} = 72$ 9) $(x-5)^{\frac{5}{3}} - 73 = 170$ 10) $x - 10 = \sqrt{3x}$
11) $\sqrt{21x+1} = x+5$ 12) $\sqrt[4]{3-8x^2} = 2x$ 13) $\sqrt{3x+2} = \sqrt{5x-12}$ 14) $\sqrt[3]{12x-5} - \sqrt[3]{8x+15} = 0$
15) $\sqrt{x+2} = 2 - \sqrt{x}$

16) Perform the operation and simplify: $\frac{4x}{5x-20} \div \frac{x^2-2x}{x^2-6x+8}$

17) Solve the inequality: $2x^2 - x \geq 1$

18) Solve for x: $\frac{6x}{x+4} + 4 = \frac{2x+2}{x-1}$

19) Find a polynomial (multiply it out) that has roots $3 + \sqrt{5}$ and $3 - \sqrt{5}$.

20) Graph and label the Domain, VA, HA, SA, Hole, x-int, and y-int: $y = \frac{3x^2}{x^2-5x}$

Assignment #10-3

Precalc Book: Pg. 587 1, 5, 9, 12, 14, 21, 25, 43, 44, 46, 48, 49, 52, 57, 59, 61, 62, 65, 79, 84, 89, 95, 99, 102, 113

Additional Problems:

- Evaluate the logarithms without using a calculator.
 - $\ln e^3$
 - $5^{\log_5 7}$
 - $\log_3 81$
 - $\log_{36} 6$
 - Graph the exponentials or logarithms without a calculator. Show at least 2 points and the asymptote.
 - $y = e^x - 4$
 - $y = -3^{x+2}$
 - $y = \log_2(-x) + 1$
 - Solve the equations for x.
 - $14 = 3e^{0.43x}$
 - $3 \log_2(x + 1) = 6$
 - $\ln(x) - \ln(x - 1) = \ln(3x)$
 - Find the time for the principal to double on an investment that is compounded continuously at $5\frac{1}{2}\%$. ($A = Pe^{rt}$)
 - Find the inverse of the function $f(x) = 2^{x-1} + 3$
-

Assignment #10-4

Precalc Book: Pg. 598 2, 8, 9, 15, 17, 22, 25, 28, 31, 36, 39, 43, 47, 53, 55, 57, 61, 68, 74, 75, 79, 82, 83, 91

Additional Problems:

- Given the recursive sequence: $a_k = a_{k-1} - 5$ where $a_1 = 2$
 - Find the first 5 terms of the sequence.
 - Write a general nth term formula for the sequence.
- Write the sum using sigma notation $\frac{1}{2(1)} + \frac{1}{2(2)} + \frac{1}{2(3)} + \frac{1}{2(4)} + \dots + \frac{1}{2(20)}$
- Write this series in sigma notation. $\frac{1}{2(1)} - \frac{1}{2(2)} + \frac{1}{2(3)} - \frac{1}{2(4)} + \dots - \frac{1}{2(20)}$
- How much will a \$5,000 investment be worth in 20 years if it is compounded quarterly at 6.5%?
 $(A = P \left(1 + \frac{r}{n}\right)^{nt})$
- Graph $y = -2 \log_3(x + 1)$. Show at least 2 points and the asymptote.
- Solve the exponential equation without using a calculator. $4^{x+1} = 64$
- Rewrite $e^{3x} \cdot e^{x^2} \cdot e^4$ as a single exponential.

Assignment #10-5

Precalculus Book: Pg. 607 – 610 1, 5, 8, 12, 19, 23, 25, 28, 31, 33, 36, 45, 48, 56, 57, 60, 69, 103

Additional Problems:

- Given the sequence: 4, -2, -8, -14, ...
 - Write the general nth term formula for the sequence.
 - Write the recursive formula for the sequence.
 - Find the sum of the first 40 terms in the sequence.
- Write the series in sigma notation.
 - $\frac{1}{2} + \frac{2}{4} + \frac{6}{8} + \frac{24}{16} + \frac{120}{32} + \frac{720}{64}$
 - $1 - \frac{1}{2} + \frac{1}{4} - \frac{1}{8} + \dots - \frac{1}{128}$
- Given the recursive formula $a_{k+1} = \frac{a_k}{3} + 5$ where $a_1 = 2$
 - List the first 5 terms of the sequence.
 - Find a_{12}
- Determine which of the following are functions. (write yes or no)
 - $x^2 - y = 5$
 - $x^2 - 5 = -y^2$
 - $y = -\ln(x - 4)$
- If $\log_x 2 = 0.651$ and $\log_x 5 = 0.972$ find:
 - $\log_x 10$
 - $\log_x 25$
 - $\log_x \frac{5}{4}$
 - $\log_x \sqrt[3]{2}$
- Simplify the following. List any domain restrictions.
 - $\frac{2}{x-3} - \frac{5x}{x+2}$
 - $\frac{\frac{1}{x}+3}{x+2}$
 - $\frac{x^3-8}{3x^2-4x-4}$

Assignment #10-6

Precalculus Book: Pg. 655 1, 2, 8, 9, 10, 11, 12, 13, 15

Pg. 252 2, 8, 15, 17, 20, 22, 25

Pg. 253 2, 5, 6, 7, 11, 16, 19

Additional Problems:

1. Sandra starts a savings plan in which she deposits an increasing amount in the bank each month. The first month she deposits \$35, the second month she deposits \$37, the third month she deposits \$39, and so on. If she continues saving at this rate, how much will she have deposited in the savings account after 24 months?

2. The table shows Devon's salary for the first five years of his job. The company he works for promises to continue the same rate of increase in his salary for as long as he works at the company.

Time (years)	Devon's Salary (\$)
1	55,000
2	56,650
3	58,350
4	60,100
5	61,903

- b. Write the n th term formula to give Devon's salary for the n th year.
 - c. What will his salary be in the 20th year?
3. A cold virus infects 6 students at a school in the same day. In the following days, the number of students infected with the virus increases at a rate of 8% each day. How many new students are infected on the 8th day?
 - a. Determine whether the spread of the virus follows an arithmetic or geometric pattern.
 - b. Write the n th term formula to give the number of new students infected on day n .
 - c. How many new students are infected on the 10th day.
 - d. How many total students have had the virus on the 10th day.
 4. Determine whether each situation is best modeled by an arithmetic or geometric series. Explain your reasoning.
 - a. Janice receives \$35 for her birthday. She deposits the money in a savings account and then saves an additional \$12 each month.
 - b. Lee has \$85 in a savings account. Each month the bank adds interest based on a yearly rate of 3%.