Algebra 2 Pre-Ap Study Guide

Do the following problems on binder paper showing all your work.

These problems are similar to the final exam, they cover the same material as the final so STUDY!

1) What is the transformation of the graph of $y = x^2$ that yields $y = -3(x-2)^2 + 1$?

2) Give the domain and range of the function shown in **Figure 1**.

3) Given $f(x) = 2x^2 - x - 3$ and $g(x) = x + 1$, find $\frac{f(x)}{g(x)}$.

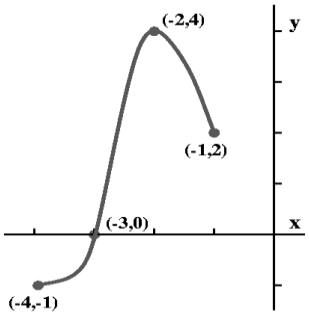


Figure 1

4) Solve $\frac{x+10}{x^2+16x+63} = \frac{4}{x+9} + \frac{11}{x+7}$

5) Divide $5x^2 - 17x + 6 \div x - 3$.

6) Factor $25x^2 - 16y^2$.

7) Simplify $\frac{1}{3x^2+2x-1} + \frac{2}{x^2-x-2}$.

8) Simplify $\frac{3x+3}{x^2+3x+2} \cdot \frac{x^2-x-6}{2x^2-9x+9}$.

9) Simplify $\frac{2x^2-x-3}{4x^2-9} \div \frac{x^2-9x+14}{4x^2-2x-6}$.

10) Identify all asymptotes of $f(x) = \frac{x^2-2x+4}{x^2-1}$.

11) What is the domain of the function $f(x) = \frac{1}{x^2+8x+15}$?

12) What is the simplified form of the rational expression $\frac{4x^2-36x+56}{x^3-9x^2+14x}$?

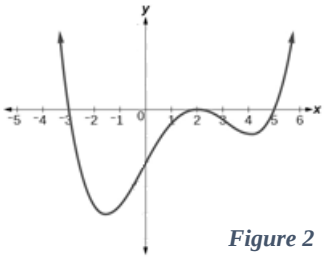


Figure 2

13) Write a polynomial function that could have generated the graph shown in **Figure 2**.

14) What is the degree of the simplest polynomial with integer coefficients and 3 and $\sqrt{3}$ as zeros?

15) Identify the asymptotes, domain, and range of the function $g(x) = \frac{2}{x+4} + 1$.

16) Find the inverse of $f(x) = 3(x-4)^2 + 1$.

17) Solve $\sqrt[3]{4x^2 - 4x + 1} - \sqrt[3]{x} = 0$.

18) Graph $f(x) = \sqrt[3]{x-6}$ +2?

19) Find the inverse of $y = 3\sqrt{x-3} + 3$.

20) Solve $(3x + 28)^{\frac{1}{2}} = x$.

21) Simplify $\sqrt[4]{48x^5y^6}$.

22) Simplify $\frac{3}{2}x^{\frac{2}{3}}y^{\frac{1}{2}} \cdot 4x^{-\frac{1}{3}}y^{\frac{3}{2}}$.

23) State the domain and range for the function $h(x) = e^{x-7} - 2$.

Figure 3

24) An ancient Greek theater had 30 seats in the front row. Each row behind had 2 more seats. Write a recursive rule for the number of seats a_n in row n. How many seats are in the 7th row?

25) Write an explicit rule for the n^{th} term of the arithmetic sequence $-7, -4, -1, 2, ...$

26) Write the function whose graph is shown in **Figure 4**.

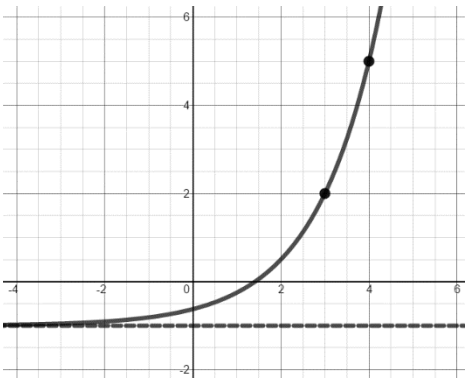


Figure 4

27) Find the exact value of $\log_5 500 - \log_5 4$.

28) Find the exact value of $\log_3 27 + \log_3 9$.

29) Find the exact value of $\log_2 128$.

30) Solve $\log_4(2x - 1) + 3 = 5$.

31) Solve $3 \ln e^{2x+4} = e^{\ln 9}$.

32) Evaluate $\log_4 \frac{1}{64}$.

33) Solve $27^{x+2} = 9$.

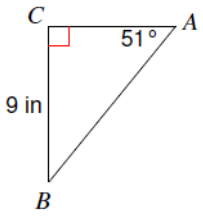
34) Expand $\ln\left(\frac{36x^3}{\sqrt{x}}\right)$.

35) Graph $f(x) = \sqrt{x-5} + 1$. State the domain and range.

36) Graph $g(x) = 2e^{x+1} + 3$. State the domain and range.

37) Describe the transformations from the parent function for $f(x) = \frac{1}{2}\log_3(x - 4) + 6$.

38) Solve $17^x = 34$.



39) Evaluate $\log_4 8$.

40) Solve the triangle in figure 5

41) Convert $\frac{11\pi}{8}$radians to degrees. Convert 220 degrees to radians.

42) Find a positive and negative coterminal angle to $210° \; and \; -\frac{2\pi}{5}$

43) Find the exact value of $\cos\frac{37\pi}{4}$.

44) Find the exact value Tan -60

45) Draw the angle $-\frac{7\pi}{3}$

46) Prove the following:

(A) $\frac{cotx}{cscx} = cosx$

(B) $sin^2x(1 + cot^2x) = 1$

(C) $\frac{\sec x}{\sin x} - \frac{\sin x}{\cos x} = cotx$

47) Solve each equation for 0 < x < 360

(A) $-4\sqrt{2} = -8cosx$ $(B)\ 5 + \sin(x + 225) = \frac{10-\sqrt{2}}{2}$

48) Graph the following:

(A) $y = -2\cos(2x + \pi) + 1$ $(B)\ y = 2sin3(x - 2\pi) + 3$ (C) $y = \tan\frac{1}{2}(x + 4\pi) - 1$

(D) $x^2 + y^2 - 8x + 2y + 13 = 0$ (E) $25x^2 + 9y^2 - 100x + 36y - 89 = 0$

(F) $4x^2 - y^2 - 24x - 2y + 19 = 0$