

**Precalculus/Honors Algebra 3-4 Fall Semester Multiple Choice Final Review**

1. For  $g(x) = 2x^3 - 8x^2 - 2x + 5$ , find  $g(-3)$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. If  $f(x) = 4 - x^2$  and  $g(x) = x + 2$ , find  $f(g(x))$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. If  $f(x) = x^2 + 4x + 5$  and  $g(x) = x - 7$ , find  $3g(f(-2))$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4. Given  $f(x) = 3x^2 + 7x - 2$  and  $g(x) = 4x + 3$ , find  $(g - f)(x)$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5. Find the domain of  $f(x) = \frac{2x}{\sqrt{x+4}}$

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

6. Describe the transformation of the graph of  $f(x) = x^3$  for the graph of  $g(x) = (x + 5)^3 - 9$

A Horizontal shift 5 units to the right. Vertical shift 9 units down.

B Horizontal shift 5 units to the right. Vertical shift 9 units up.

C Horizontal shift 5 units to the left. Vertical shift 9 units down.

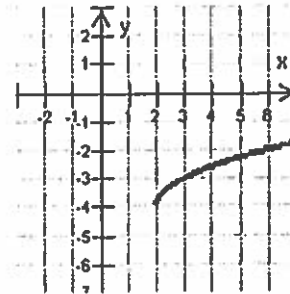
D Horizontal shift 5 units to the left. Vertical shift 9 units up.

7. Describe the transformation of the graph of  $f(x) = x^2$  for the graph of  $g(x) = -\frac{3}{4}(x-8)^2 + 10$

- Vertical Stretch. Reflection over the x-axis. Horizontal shift 8 units to the left.
- Vertical Stretch. Reflects over the x-axis. Horizontal shift 8 units to the left.
- Vertical shift 10 units up.
- Vertical Stretch. Horizontal shift 8 units to the right. Vertical shift 10 units up.
- Vertical Stretch. Reflects over the x-axis. Horizontal shift 8 units to the right.
- Vertical shift 10 units up.

8. Write the equation for the given graph:

- $y = x^2 - 2$
- $y = x^2 + 4$
- $y = x^2 - 4$
- $y = x^2 + 2$



9. For each of the following functions determine if they are even, odd, both, or neither:

a.  $f(x) = 4x^2 + 8x - 2$

- Even
- Odd
- Both
- Neither

b.  $f(x) = |x| + 3$

- Even
- Odd
- Both
- Neither

c.  $f(x) = x^3 - 2x$

- Even
- Odd
- Both
- Neither

10. Find the inverse of:  $f(x) = 2x - 3$

- $f^{-1}(x) = \frac{x+3}{2}$
- $f^{-1}(x) = \frac{x-3}{2}$
- $f^{-1}(x) = 2x + 3$
- $f^{-1}(x) = 2x - 3$

11. Find the x-intercept(s):  $f(x) = \frac{3x-5}{x+4}$

A  $x = \frac{5}{3}$   
B  $x = -\frac{5}{3}$   
C  $x = \frac{4}{3}$   
D  $x = -\frac{4}{3}$

12. Use long division to divide:  $(4x^3 - 8x^2 + 5x - 2) \div (2x - 3)$

A  $2x^2 - 2x + 1$   
B  $2x^2 - 2x + 1 + \frac{4}{2x-3}$   
C  $2x^2 - 2x + 1 + \frac{4}{2x-3}$   
D  $2x^2 - 2x + 1 + \frac{4}{2x-3}$

13. Use synthetic division to divide:  $(4x^3 - 3x + 5) \div (x + 1)$

A  $4x^2 - 4x + 1$   
B  $4x^2 - 4x + 1 + \frac{9}{x+1}$   
C  $4x^2 - 4x + 1 + \frac{9}{x+1}$   
D  $4x^2 - 4x + 1 + \frac{9}{x+1}$

14. Find the horizontal or slant asymptote(s):  $f(x) = \frac{x^2 - x}{x + 1}$

A  $x = 1$   
B  $x = 0, y = 1$   
C  $y = x - 2$   
D  $x = 1$

15. Find the horizontal or slant asymptote(s):  $f(x) = \frac{2x-1}{x}$

A  $x = 0$   
B  $x = 1$   
C  $y = 2x$   
D  $x = 2$

16. Find the vertical asymptote(s):  $f(x) = \frac{x-6}{x^2-4}$



17. Divide, then express your answer in standard form:  $\frac{8-7i}{1-2i}$



18. Multiply, then express your answer in standard form:  $(6-2i)(2-3i)$



19. Find the real zeros of the function:  $f(x) = 6x^4 + 11x^3 + 2x^2 - 5x - 2$



20. Find all the zeros of the function:  $f(x) = x^4 - 4x^3 + 8x^2 - 16x + 16$



21. Find a polynomial function that has a zero at 2, and a multiplicity of 2 for zeros at 0 and -3

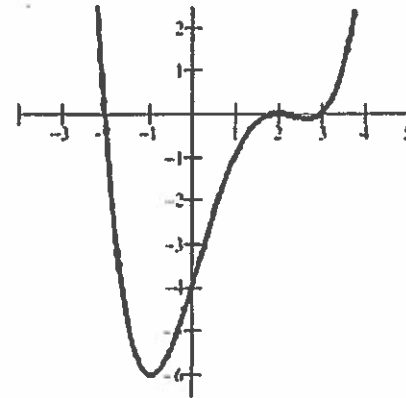
- A  $f(x) = x^3 + x^2 - 6x$
- B  $f(x) = x^3 + 4x^2 - 3x - 18x$
- C  $f(x) = x^3 - 10x^2 - 3x - 18x$
- D  $f(x) = x^3 - 4x^2 - 3x + 18x$

22. Find a 4<sup>th</sup> degree polynomial function that the following zeros: -2, 3, 2i

- A  $f(x) = x^4 - 2x^3 + 3x^2 - 2x - 12$
- B  $f(x) = x^4 - 2x^3 + 3x^2 - 2x + 12$
- C  $f(x) = x^4 + 2x^3 + 3x^2 - 2x - 12$
- D  $f(x) = x^4 + 2x^3 + 3x^2 - 2x + 12$

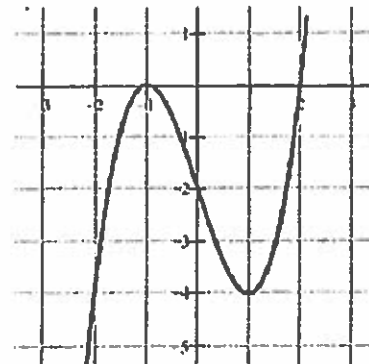
23. Which of the following is the equation for the given graph?

- A  $f(x) = x^2 - 2x - 3$
- B  $f(x) = x^2 + 2x - 3$
- C  $f(x) = x^2 - 2x + 3$
- D  $f(x) = x^2 + 2x + 3$



24. The figure shows the graph of  $f(x) = (x+1)(x-2)(x-a)$   
Determine the value of  $a$

- A -1
- B -2
- C 1
- D 2



25. Match the following equations with the appropriate graphs:

\_\_\_\_\_ I.  $y = \frac{-1}{2}(x-1)^3(x+2)$

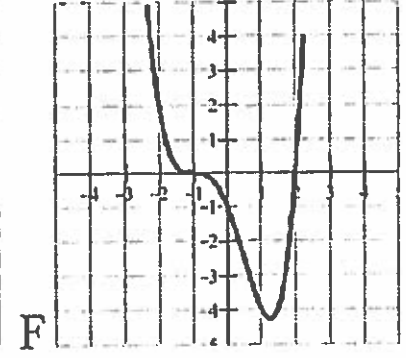
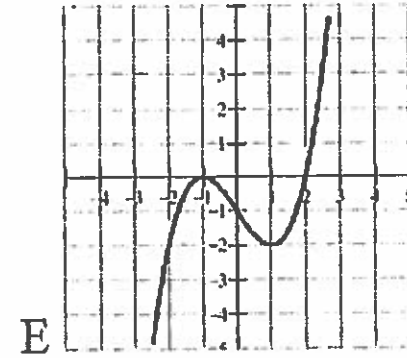
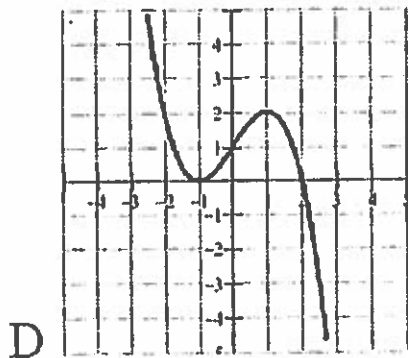
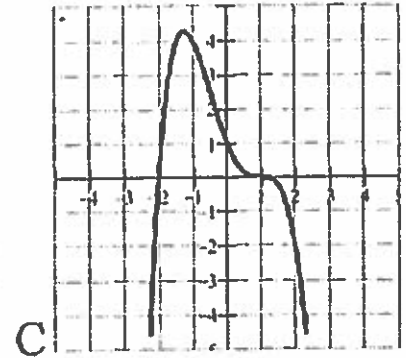
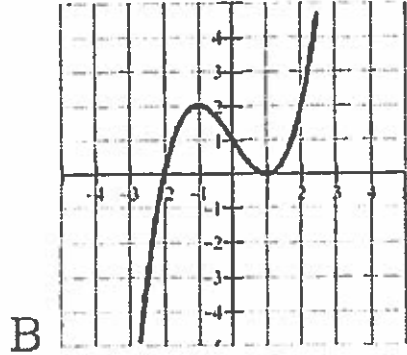
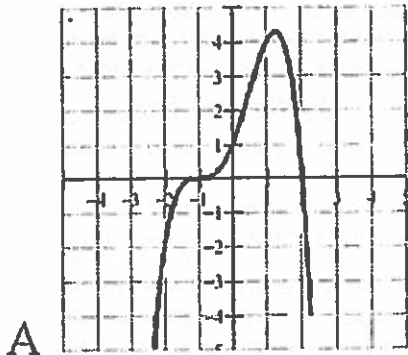
\_\_\_\_\_ II.  $y = \frac{1}{2}(x+1)^3(x-2)$

\_\_\_\_\_ III.  $y = -\frac{1}{2}(x+1)^3(x-2)$

\_\_\_\_\_ IV.  $y = \frac{1}{2}(x+1)^2(x-2)$

\_\_\_\_\_ V.  $y = -\frac{1}{2}(x+1)^2(x-2)$

\_\_\_\_\_ VI.  $y = \frac{1}{2}(x-1)^2(x+2)$



26. Write in exponential form:  $\log_a y = x$



27. Evaluate  $\log_3 8$  using the change of base formula



28. Rewrite  $4\ln(3) - \frac{1}{2}\ln(9)$  as a single logarithm

[Redacted]

29. Rewrite  $\log 2 + 3\log 4$  as a single logarithm

[Redacted]

30. Write as a sum, difference, or multiple of logarithms:  $\log \sqrt{\frac{(x-1)^2}{(x-3)(x+2)^3}}$

[Redacted]

31. Write as a sum, difference, or multiple of logarithms:  $\log \left( \frac{xy^3}{z^2w} \right)^7$

[Redacted]

32. Solve  $8^x = 40$  for  $x$  in common log form.

[Redacted]

33. Solve  $5^x = 32$  for  $x$  to the nearest hundredth.

[Redacted]

34. Solve for  $x$ :  $4^{2x-7} = 1024$

[Redacted]

35. Solve for  $x$ :  $9^{3x} = 243^{3x-2}$

[Redacted]

36. Solve for  $x$ :  $\log(10^{3x-11}) = 40$

A. 13  
B. 14  
C. 5  
D. 17

37. Solve for  $x$ :  $\ln e^{3x+3} = 22$

A. 5  
B. 22  
C.  $5 \ln e$   
D.  $-3 + \ln 22$



38. Solve for  $x$ :  $\log(1-2x) - \log(x-1) = 1$



D. no solution

39. Solve for  $x$ :  $\log_4(x) + \log_4(x+2) = \log_4(3x+56)$



40. You win \$10,000 in the state lottery and deposit the earnings in a bank account. The money is invested at a rate of 6.2% compounded continuously. How many years will it take to double your money?



41. Find the initial amount invested at  $7\frac{1}{4}\%$  interest compounded quarterly if, after 6 years, it has grown to \$20,000.



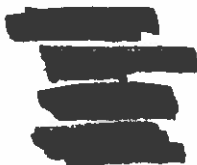
42. Determine the annual rate of interest compounded continuously for the sum of money in an account to quadruple in 25 years.



51. Find the 90<sup>th</sup> term of the arithmetic sequence with  $a_1 = 3$  and  $a_2 = 9$  (assume that  $n$  begins with 1).



52. Find the sum of the first 100 terms of the arithmetic sequence whose  $n$ th term is  $a_n = 9n - 6$  (assume that  $n$  begins with 1).



53. Find the sum:  $\sum_{n=2}^7 \frac{2}{n+3}$



54. Evaluate:  $\sum_{n=1}^{\infty} 5\left(\frac{2}{3}\right)^{n-1}$

