

## PreAP Precalculus

## TEST Chapter 2.1-2.5, Form A. No Calculator

Part I: Multiple Choice, Put your CAPITAL LETTER answer choice in the blank to the left of the number.

- \_\_\_\_\_ 1. Find the range of  $f(x) = -3 - 7e^{4/9-5x}$   
 (A)  $(-\infty, -3]$  (B)  $(-\infty, -3)$  (C)  $[-3, \infty)$  (D)  $(-3, \infty)$  (E) all real numbers
- \_\_\_\_\_ 2. If  $K(x) = \frac{6}{5x-10}$  and  $N(x) = \sqrt{x-2}$ , what is the domain of  $h(x) = (K \circ N)(x)$ ?  
 (A)  $[2, \infty)$  (B)  $(2, \infty)$  (C)  $(2, 6) \cup (6, \infty)$  (D)  $[2, 6) \cup (6, \infty)$  (E) all real numbers
- \_\_\_\_\_ 3. If  $f(x) = 3 - 5 \ln\left(\frac{7}{10} - \frac{2}{5}x\right)$ , then  $f(x)$  is ...  
 (A) increasing on  $\left(-\infty, \frac{7}{4}\right)$  (B) decreasing on  $\left(-\infty, \frac{7}{4}\right)$  (C) increasing on  $\left(\frac{7}{4}, \infty\right)$   
 (D) decreasing on  $\left(\frac{7}{4}, \infty\right)$  (E) none of these
- \_\_\_\_\_ 4. If  $f(x) = 5 - 7e^{x+1}$ , what is the range of  $g(x) = |f(x)|$ ?  
 (A)  $(0, \infty)$  (B)  $[0, \infty)$  (C)  $(0, 5)$  (D)  $[0, 5)$  (E)  $(5, \infty)$
- \_\_\_\_\_ 5. If  $g(x) = \frac{9-7x}{8x-3}$ , then the domain of  $g^{-1}(x)$  is  
 (A)  $\left(-\infty, \frac{3}{8}\right) \cup \left(\frac{3}{8}, \infty\right)$  (B)  $\left(-\infty, \frac{9}{8}\right) \cup \left(\frac{9}{8}, \infty\right)$  (C)  $(-\infty, -3) \cup (-3, \infty)$  (D)  $\left(-\infty, -\frac{7}{8}\right) \cup \left(-\frac{7}{8}, \infty\right)$  (E)  
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- \_\_\_\_\_ 6. If  $h(x) = \ln(7+4x)$ , find two functions,  $f$  and  $g$ , such that  $h(x) = f(g(x))$ .  
 (A)  $f(x) = 2 + x$ ,  $g(x) = \ln(4x-1)$  (B)  $f(x) = \ln(4x-1)$ ,  $g(x) = 2 + x$   
 (C)  $f(x) = 2 + \ln(4x)$ ,  $g(x) = x-1$  (D)  $f(x) = 2 + \ln x$ ,  $g(x) = 4x-1$  (E)  
 $f(x) = 2 + \ln(4x-1)$ ,  $g(x) = e^x$
- \_\_\_\_\_ 7. Determine if  $f(x) = \frac{7\sqrt[3]{x^2-5}-8}{3\sqrt{2x^2+1}}$  is Even, Odd, or Neither.  
 (A) Even (B) Odd (C) Neither (D) None of these (E) All of these
- \_\_\_\_\_ 8. In the function  $g(x) = f\left(\frac{4}{7}x\right)$ , the graph of  $g(x)$  is obtained from the graph of  $f(x)$  by a  
 (A) Vertical stretch bfo  $\frac{7}{4}$  (B) Horizontal compression bfo  $\frac{7}{4}$  (C) Horizontal stretch bfo  $\frac{4}{7}$   
 (D) Horizontal stretch bfo  $\frac{7}{4}$  (E) Vertical compression bfo  $\frac{7}{4}$

Part II: Free Response

Show all work BELOW THE LINE. No credit will be given for any work done above the line. Label each part, use proper notation, and box your final answers. Remember that on this section, your PROCESS is as important as your PRODUCT. BE SURE TO NAME EACH OF YOUR FUNCTIONS.

9. Given the following functions, answer the following questions.

$$f(x) = x^2 - 4 \quad g(x) = 3\sqrt{2-x} \quad m(x) = \frac{-7}{x} \quad n(x) = 5 - 3x \quad p(x) = 6 + 5x$$

(a) Find  $h(x) = g(n(x))$ , find the domain, then simplify.

(b) Find  $h(x) = f(g(x))$ , find the domain, then simplify.

(c) Find  $h(x) = m(m(x))$ , find the domain, then simplify.

(d) Find  $h(x) = \frac{g(x)}{(n \circ p)(x)}$ , then find the domain, then simplify.

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10. For  $f(x) = \frac{7}{9} + \frac{3}{4} \ln\left(1 - \frac{5}{11}x\right)$

(a) Write  $f(x)$  in standard transformation form.

(b) Find the **simplified, exact value** of the of the y-intercept. Show the work that leads to your answer.

(c) Sketch  $f(x)$  showing the basic shape, y-intercept, and any/all asymptotes.

(d) Find  $D_f$  :

(e) Find  $R_f$  :

(f) Find the **Equation(s)** of any/all asymptotes. Be sure to label which type they are.

(g) Find  $\lim_{x \rightarrow -\infty} f(x)$

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