

Name KEY

Date _____

Period _____

PreAP Precalculus

TEST Chapter 2.1-2.5, Form B. No Calculator

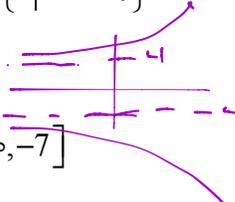
Part I: Multiple Choice

Put your CAPITAL LETTER answer choice in the blank to the left of the number.

- E 1. Find the **range** of $f(x) = 3e^{4+5x} - 3$
 (A) $(-\infty, -3)$ (B) $[-3, \infty)$ (C) $(-\infty, -3]$ (D) $(3, \infty)$ (E) $(-3, \infty)$

- A 2. If $f(x) = \frac{2}{2x-1}$ and $g(x) = \sqrt{x-1}$, what is the domain of $h(x) = (f \circ g)(x)$?
 (A) $\left[1, \frac{5}{4}\right) \cup \left(\frac{5}{4}, \infty\right)$ (B) $[1, \infty)$ (C) $\left(1, \frac{5}{4}\right) \cup \left(\frac{5}{4}, \infty\right)$ (D) $(1, \infty)$ (E) $\left[-1, \frac{5}{4}\right) \cup \left(\frac{5}{4}, \infty\right)$
Handwritten notes: $2\sqrt{x-1} - 1$, $x \neq \frac{1}{2}$, $x < 1$, $x \neq \frac{5}{4}$

- A 3. If $f(x) = 3 + \frac{2}{3} \ln\left(\frac{3}{4} - \frac{4}{5}x\right)$, what is the domain of $f(x)$?
 (A) $\left\{x \mid x < \frac{15}{16}\right\}$ (B) $\left\{x \mid x < \frac{16}{15}\right\}$ (C) $\left\{x \mid x < -\frac{3}{4}\right\}$ (D) $\left\{x \mid x > -\frac{3}{4}\right\}$ (E) $\left\{x \mid x > \frac{16}{15}\right\}$
Handwritten notes: $\frac{3}{4} - \frac{4}{5}x > 0$, $-\frac{4}{5}x > -\frac{3}{4}$, $x < \frac{3}{4}$, $x < \frac{15}{16}$

- B 4. If $f(x) = -3e^x - 4$, what is the range of $g(x) = |f(x)|$?
 (A) $(-4, \infty)$ (B) $(4, \infty)$ (C) $(-7, \infty)$ (D) $(7, \infty)$ (E) $(-\infty, -7]$


- B 5. If $g(x) = \frac{2-5x}{3x-7}$, then the **range** of $g^{-1}(x)$ is *Domain of g*:
 5(A) $\left(-\infty, -\frac{5}{3}\right) \cup \left(-\frac{5}{3}, \infty\right)$ (B) $\left(-\infty, \frac{7}{3}\right) \cup \left(\frac{7}{3}, \infty\right)$ (C) $\left(-\infty, \frac{2}{5}\right) \cup \left(\frac{2}{5}, \infty\right)$ (D) $\left(-\infty, \frac{2}{3}\right) \cup \left(\frac{2}{3}, \infty\right)$ (E) $\left(-\infty, \frac{2}{3}\right) \cup \left(\frac{2}{3}, \infty\right)$
Handwritten notes: $x \neq \frac{7}{3}$

7

- B 6. If $h(x) = 5 + e^{3x-1}$, find two functions, f and g , such that $h(x) = f(g(x))$.
 (A) $f(x) = 5 + e^{3x}$, $g(x) = x - 1$ (B) $f(x) = 5 + e^{3x}$, $g(x) = x - \frac{1}{3}$
 (C) $f(x) = 4 + e^{3x-1}$, $g(x) = x + 1$ (D) $f(x) = 5 + e^{3x+1}$, $g(x) = x - 1$ (E) $f(x) = 5x$, $g(x) = e^{3x-1}$

- D 7. If $g(x) = 3\sqrt{7-x}$, $h(x) = 3 + 3x$, and $j(x) = 5 - 2x$, what is the domain of $p(x) = \frac{g(x)}{(h \circ j)(x)}$?
 (A) $(-\infty, \infty)$ (B) $(-\infty, 3) \cup (3, \infty)$ (C) $(-\infty, 7]$ (D) $(-\infty, 3) \cup (3, 7]$ (E) $[7, \infty)$
Handwritten notes: $7 \geq x$, $x \leq 7$, $3 + 3(5 - 2x) \neq 0$, $3 + 15 - 6x \neq 0$, $18 \neq 6x$, $x \neq 3$

- D 8. In the function $g(x) = 4\sqrt{x}$, the 4 vertically stretches the graph of $f(x) = \sqrt{x}$ by a factor of 4. This is equivalent to what other transformation on f to produce the graph of g ?
 (A) Horizontal compression bfo 2 (B) Horizontal compression bfo 4 (C) Horizontal stretch bfo 2
 (D) Horizontal compression bfo 16 (E) Horizontal stretch bfo 16

$4\sqrt{x} = \sqrt{16x}$

Part II: Free Response

Show all work in the space provided. 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.

- ① E
- ② A
- ③ A
- ④ B
- ⑤ B
- ⑥ B
- ⑦ D
- ⑧ D

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

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

$$f(x) = \frac{3}{4} \ln\left(-3x + \frac{5}{4}\right) + \frac{7}{5}$$

$$f(x) = \frac{3}{4} \ln\left(-3\left(x - \frac{5}{12}\right)\right) + \frac{7}{5}$$

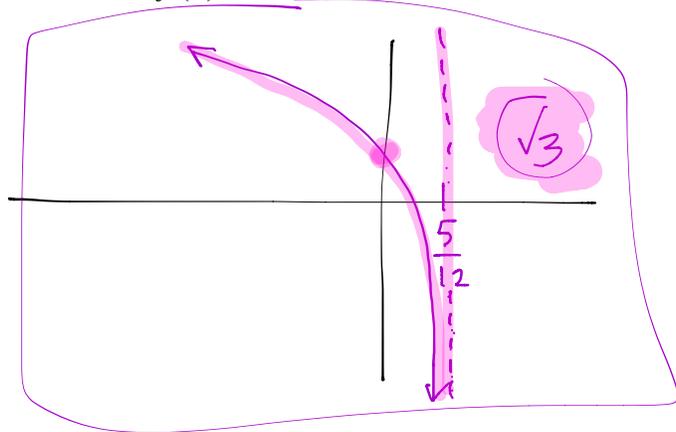
✓1

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

$$f(0) = \frac{3}{4} \ln\left(\frac{5}{4}\right) + \frac{7}{5} > 0$$

✓2

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



(d) Find D_f :

$$D_f: \{x \mid x < \frac{5}{12}\}$$

$$D_f: (-\infty, \frac{5}{12})$$

✓4

* (d), (e), & (f)
can recover credit
if answers match
graph

(e) Find R_f :

$$R_f: \mathbb{R}$$

$$R_f: \{x \mid x \in \mathbb{R}\}$$

$$R_f: (-\infty, \infty)$$

✓5

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

$$VA @ x = \frac{5}{12}$$

✓6

(g) Find

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

∞
or
DNE

✓7

E.R.

7 checks

15 checks TOTAL