Honor Statement
By signing my name, I am verifying the following statement is true.

In completing this test, I pledge on my honor that:
I will/have completed all steps of the attached test on my own. **I did not directly copy ANY solutions from my peers nor did I use any calculators or other resources other than MY notes.** I understand if I violate this honor code, I will receive a zero for this test. *I further understand that if I fail to submit this test on time it will be considered late, and I will receive 70% of the final grade. If I am absent I understand I will be required to take the makeup version of the exam.*

Signature: _____ Date:_____
Signature **and** Date
Only tests with the SIGNED Honor Statement at the top/front will be graded.

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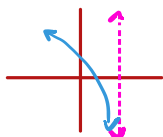Put your CAPITAL LETTER answer choice in the blank to the left of the number.

A 1. Determine if $g(x) = \dfrac{2x^2 - 5x^6 + 9x^4 - 3}{4}$ *No signs change.* is Even, Odd, or Neither.

(A) Even   (B) Odd   (C) Neither   (D) Coke   (E) Is Pepsi OK?

B 2. If $g(x) = 4\ln(3 - 5x) - 3$, the interval over which $g(x)$ is decreasing is

$g(x) = 4\ln\left(-5\left(x - \tfrac{3}{5}\right)\right) - 3$

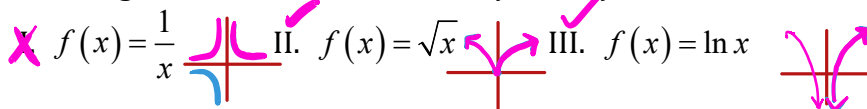(A) $(-\infty, \infty)$ (B) $\left(-\infty, \dfrac{3}{5}\right)$ (C) $\left(-\infty, -\dfrac{3}{5}\right)$ (D) $(-\infty, 3)$

(E) $g(x)$ is not decreasing on its domain.

C 3. Find the domain of $f(x) = 5 - \dfrac{1}{3}\ln(2x - 9)$.

$f(x) = -\dfrac{1}{3}\ln\left(2\left(x - \tfrac{9}{2}\right)\right) + 5$

(A) $D_f: \left(-\infty, \dfrac{9}{2}\right]$ (B) $D_f: \left(-\infty, \dfrac{9}{2}\right)$ (C) $D_f: \left(\dfrac{9}{2}, \infty\right)$ (D) $D_f: \left[\dfrac{9}{2}, \infty\right)$ (E) $D_f: (-\infty, \infty)$

E 4. For which of the following functions is the RANGE of $f(x) = f(|x|)$?

I. $f(x) = \dfrac{1}{x}$ II. $f(x) = \sqrt{x}$ III. $f(x) = \ln x$

(A) I only   (B) II only   (C) III only   (D) I and III only   (E) II and III only

A 5. The graph of the function $g(x) = \dfrac{2}{3} - \dfrac{4}{7}\left|\dfrac{3}{5} - \dfrac{4}{3}x\right|$ has which of the following transformations on the graph of $f(x) = |x|$?

$g(x) = -\dfrac{4}{7}\left|-\dfrac{4}{3}\left(x - \tfrac{9}{20}\right)\right| + \dfrac{2}{3}$

(A) Right $\dfrac{9}{20}$ (B) Left $\dfrac{9}{20}$ (C) Right $\dfrac{3}{5}$ (D) Left $\dfrac{3}{5}$ (E) None of these are correct

B 6. In the function $g(x) = 8x^3$, the 8 stretches the graph of $f(x) = x^3$ vertically by a factor of 8. This is equivalent to what other transformation on f to produce the graph of g?

$g(x) = 8x^3 = 2^3x^3 = (2x)^3$

(A) Horiz. stretch bfo 8   (B) Horiz. compression bfo 2   (C) Horiz. stretch bfo 2

(D) Horiz. stretch bfo 2   (E) Horiz. shift left 8 units

E 7. Write $f(x) = 8 - \dfrac{1}{2 - \frac{3}{4}x}$ in standard transformation form.

$2 \cdot \frac{-3}{3} = \frac{-8}{3}$

(A) $f(x) = \dfrac{-3}{4\left(x - \frac{8}{3}\right)} + 8$ (B) $f(x) = \dfrac{3}{4\left(x - \frac{8}{3}\right)} + 8$ (C) $f(x) = \dfrac{-4}{3\left(x - \frac{8}{3}\right)} + 8$

(D) $f(x) = \dfrac{4}{3\left(x + \frac{8}{3}\right)} + 8$ (E) $f(x) = \dfrac{4}{3\left(x - \frac{8}{3}\right)} + 8$

$f(x) = -\dfrac{1}{-\frac{3}{4}(x-\frac{8}{3})} + 8 = \frac{4}{3} \cdot \frac{1}{x-\frac{8}{3}} + 8 = \frac{4}{3(x-\frac{8}{3})} + 8$

D 8. Which of the following is NOT true about the function $g(x) = \dfrac{x^2-3x-4}{2x^2+x-1}$? $= \dfrac{(x-4)(x+1)}{(2x-1)(x+1)}$

(A) It has a hole at $\left(-1, \frac{5}{3}\right)$.   (B) It has a VA at $x = \frac{1}{2}$.   (C) It has a HA at $y = \frac{1}{2}$.

(D) It has rotational symmetry.   (E) It has a y-intercept of $(0,4)$. $\dfrac{-1-4}{2(-1)-1} = \dfrac{-5}{-3} = \frac{5}{3}$

A 9. In the function $g(x) = \dfrac{5}{2x}$, the 2 compresses the graph of $f(x) = \dfrac{5}{x}$ by a factor of 2. This is equivalent to what other transformation on f to produce the graph of g?

(A) Vertical compression bfo 2   (B) Vertical compression bfo 10   (C) Horizontal compression bfo 2

(D) Horizontal stretch bfo 2   (E) Vertical compression bfo $\frac{5}{2}$

$g(x) = \dfrac{5}{2x} = \frac{1}{2}\left(\frac{5}{x}\right)$

D 10. If the function $j(x)$ is the function $h(x) = 6 - 3\sqrt{2x - 7}$ after it is reflected across the x-axis, vertically compressed by a factor of five before being shifted left two units and up four units. Which of the following give the function $j(x)$?

(A) $j(x) = \frac{3}{5}\sqrt{2\left(x - \frac{5}{2}\right)} + 10$ (B) $j(x) = -\frac{3}{5}\sqrt{2\left(x + \frac{3}{2}\right)} + 10$

(C) $j(x) = -\frac{1}{5}\sqrt{2(x+2)} + 4$ (D) $j(x) = \frac{3}{5}\sqrt{2\left(x - \frac{3}{2}\right)} + 10$

(E) $j(x) = -15\sqrt{2\left(x - \frac{5}{2}\right)} + 10$

$j(x) = --3 \cdot \frac{1}{5}\sqrt{2(x-\frac{7}{2}+2)} + 6 + 4$

$h(x) = 3\sqrt{2(x - \frac{3}{2})} \cdots$

Name_____ Date_____ Period_____

HPC TEST: Chapter 2.1-2.4 Form A   **NO CALCULATOR**

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Part II: Free Response

Show all work in the space provided. Show all steps and use proper notation.   Remember that on this section, your PROCESS is as important as your PRODUCT.

11. For $f(x) = -2 - \dfrac{3}{5}e^{7-3x}$.

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

$$f(x) = -\frac{3}{5}e^{-3\left(x-\frac{7}{3}\right)} - 2 \quad \checkmark\ _{11}$$

(b) Describe the sequence of transformations using the function you found in part (a).

· reflect x-axis
· vert. comp. bfo $\frac{5}{3}$.
· reflect y axis.
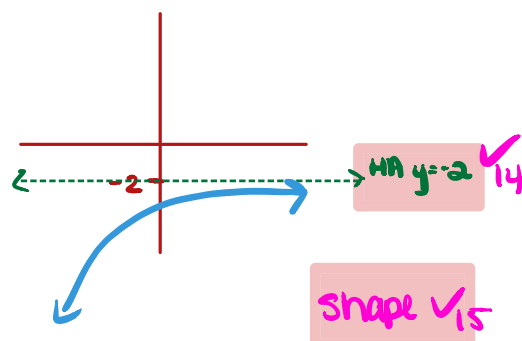· horiz. comp. bfo 3.
· right $\frac{7}{3}$.
· down 2.

$\checkmark$ 12

(b) Find the **simplified**, exact value of the y-intercept.

$$f(0) = -\frac{3}{5}e^{-3\left((0)-\frac{7}{3}\right)} - 2$$

$$f(0) = -\frac{3}{5}e^{7} - 2 \quad \checkmark\ _{13}$$

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

HA y=-2 ✓ 14

shape ✓ 15

(d) Find D_f:

$D_f : (-\infty, \infty)$ ✓ 16

$D_f : \mathbb{R}$

(e) Find R_f:

$R_f : (-\infty, -2)$ ✓ 17

$R_f : \{y \mid y < -2\}$

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

$f(x)$ has a HA at $y = -2$. ✓ 18

(g) Describe the end behavior of the function $f(x)$.

$\lim\limits_{x \to -\infty} f(x) = -\infty$ ✓ 19

$\lim\limits_{x \to \infty} f(x) = -2$ ✓ 20