

SCORE: _____ / 105 POINTS

NO CALCULATORS ALLOWED

Fill in the blanks. Write “UNDEFINED” if the value does not exist. **[NO NEED TO SHOW WORK]**

SCORE: ____ / 21 POINTS

$2^{\log_2 0} = \text{UNDEFINED}$

$\log_5 5^{-4} = -4$

$\log_3 81 = 4$

$\log_6 1 = 0$

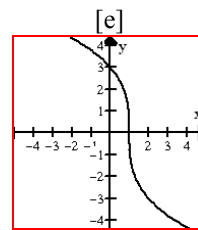
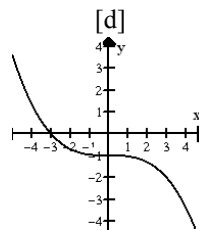
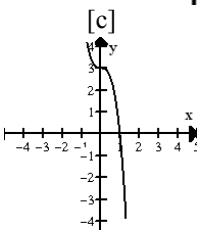
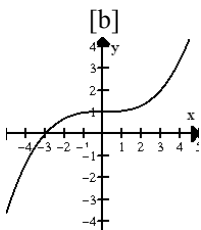
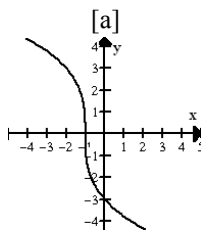
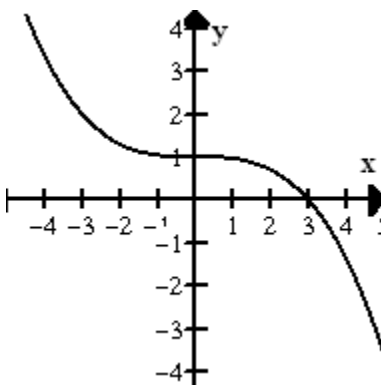
$7^{\log_7 11} = 11$

$\log_3 (-9) = \text{UNDEFINED}$

$\log 100,000 = 5$

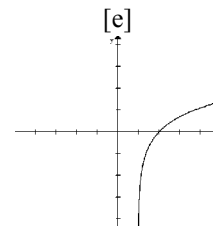
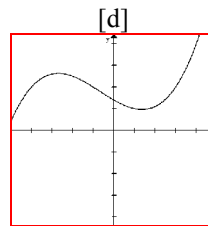
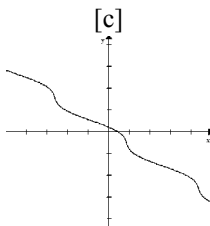
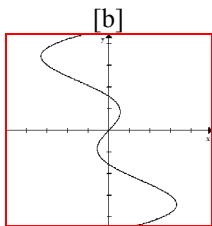
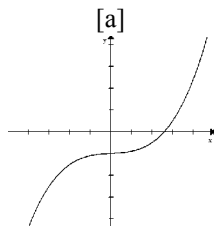
Circle the graph of the inverse of the following function.

SCORE: ____ / 6 POINTS



Circle the **two** graphs below which **DO NOT** represent one-to-one functions.

SCORE: ____ / 6 POINTS



Circle the domain of $f(x) = \log_7 x$.

SCORE: ____ / 3 POINTS

[a] $\{x \neq 7\}$

[b] $\{x > 0\}$

[c] $\{x \neq 0\}$

[d] $\mathbf{R}$

[e] $\{x > 7\}$

Circle the asymptote of $f(x) = 8^x$.

SCORE: ____ / 3 POINTS

[a] $x = 0$

[b] $y = 0$

[c] $x = 8$

[d] $y = 8$

[e] $y = 1$

**PUT A BOX AROUND EACH FINAL ANSWER**

Find the equation of the asymptote of $f(x) = 4\log_2(3x+15)$. SHOW PROPER WORK.

SCORE: ____ / 6 POINTS

$$3x + 15 = 0$$

$$x = -5$$

Find the domain of the function $f(x) = \frac{7}{2x+6} + 5$. SHOW PROPER WORK.

SCORE: ____ / 6 POINTS

$$2x + 6 \neq 0$$

$$x \neq -3$$

Write $\log \frac{z^4}{yx^5}$ as the sums and/or differences and/or multiples of logarithms of single variables.

SCORE: ____ / 6 POINTS

$$\log z^4 - \log yx^5$$

$$= \log z^4 - (\log y + \log x^5)$$

$$= 4 \log z - (\log y + 5 \log x)$$

$$= 4 \log z - \log y - 5 \log x$$

Write $\log 48 - \log 6 + \log 4$ as the logarithm of a single quantity. Simplify your answer.

SCORE: ____ / 6 POINTS

$$\log \frac{48}{6} + \log 4$$

$$= \log 8 + \log 4$$

$$= \log(8 \times 4)$$

$$= \log 32$$

Solve for x : $8^{x+3} = 4^{2x+7}$. SHOW PROPER WORK. CHECK YOUR ANSWER(S).

SCORE: ____ / 9 POINTS

$$(2^3)^{x+3} = (2^2)^{2x+7}$$

$$2^{3(x+3)} = 2^{2(2x+7)}$$

$$3(x+3) = 2(2x+7)$$

$$3x+9 = 4x+14$$

$$x = -5$$

CHECK:

$$8^{-5+3} = 8^{-2} = \frac{1}{64}$$

$$4^{2(-5)+7} = 4^{-3} = \frac{1}{64}$$

Find the inverse of the function $f(x) = 9 - \sqrt{2 - x}$. SHOW PROPER WORK.

SCORE: ____ / 9 POINTS

$$y = 9 - \sqrt{2 - x}$$

$$x = 9 - \sqrt{2 - y}$$

$$x - 9 = -\sqrt{2 - y}$$

$$(x - 9)^2 = (-\sqrt{2 - y})^2$$

$$(x - 9)^2 = 2 - y$$

$$y + (x - 9)^2 = 2$$

$$y = 2 - (x - 9)^2$$

$$f^{-1}(x) = 2 - (x - 9)^2$$

Find the range of the function $f(x) = 4 - \sqrt{7 - x}$. SHOW PROPER WORK.

SCORE: ____ / 6 POINTS

$$\sqrt{7 - x} \geq 0$$

$$-\sqrt{7 - x} \leq 0$$

$$4 - \sqrt{7 - x} \leq 4$$

$$y \leq 4$$

Solve for x : $2 + 3\log_6(5x + 1) = 8$. SHOW PROPER WORK. CHECK YOUR ANSWER(S).

SCORE: ____ / 9 POINTS

$$3\log_6(5x + 1) = 6$$

$$\log_6(5x + 1) = 2$$

$$6^{\log_6(5x+1)} = 6^2$$

$$5x + 1 = 36$$

$$5x = 35$$

$$x = 7$$

$$\text{CHECK: } 2 + 3\log_6(5(7) + 1)$$

$$= 2 + 3\log_6(35 + 1)$$

$$= 2 + 3\log_6 36$$

$$= 2 + 3(2)$$

$$= 2 + 6$$

$$= 8$$

Solve for x : $\log_2(17 - 5x) - \log_2(x + 7) = 3$. SHOW PROPER WORK. CHECK YOUR ANSWER(S).

SCORE: ____ / 9 POINTS

$$\log_2 \frac{17 - 5x}{x + 7} = 3$$

$$2^{\log_2 \frac{17-5x}{x+7}} = 2^3$$

$$\frac{17 - 5x}{x + 7} = 8$$

$$17 - 5x = 8(x + 7)$$

$$17 - 5x = 8x + 56$$

$$-13x = 39$$

$$x = -3$$

$$\text{CHECK: } \log_2(17 - 5(-3)) - \log_2(-3 + 7)$$

$$= \log_2(17 + 15) - \log_2 4$$

$$= \log_2 32 - \log_2 4$$

$$= 5 - 2$$

$$= 3$$