

# College Algebra Math 1050

## Sample Final Exam 3 - Rubric

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1.  $\begin{bmatrix} 4 & -7 \\ 6 & -13 \end{bmatrix}$  (2 pts) all or nothing

2. The graph has at most **6** turning points (2 pts) all or nothing

3.  $6,000 = 2,000 \left(1 + \frac{0.065}{4}\right)^{4t}$  **OR**  $3 = \left(1 + \frac{0.065}{4}\right)^{4t}$  (3 pts) all or nothing

4.  $a^5 = 3$  (3 pts) all or nothing

5.  $\log_b x = \frac{8}{3}$  (3 pts) all or nothing

6.  $x \neq 3, x \neq 4$  Answer can be written in any form. (3 pts) all or nothing

7.  $(-7, 0), (1, 0)$  (3 pts) all or nothing

*Answer must be written as an ordered pair*

8.  $\left(0, -\frac{7}{12}\right)$  **OR**  $(0, -0.583)$  (3 pts) all or nothing

*Answer must be written as an ordered pair*

9.  $x = -5, x = 2$  (3 pts) all or nothing

*Answer must be written as an equation*

10.  $y = 2$  (3 pts) all or nothing

*Answer must be written as an equation*

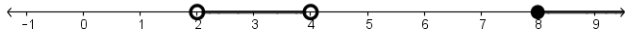
11.  $\frac{33!}{29!4!}(2a)^4(-3)^{29}$  **OR**  $\binom{33}{4}(2a)^4(-3)^{29}$

**OR**  $\binom{33}{29}(2a)^4(-3)^{29}$  (3 pts) all or nothing

12. (c)  $\left[ \begin{array}{ccc|c} 2 & 1 & -1 & 3 \\ -1 & 3 & 2 & 4 \\ 1 & -1 & 1 & 0 \\ 1 & 4 & 2 & 7 \end{array} \right]$  (3 pts) all or nothing

13.  $y \neq 2$  **OR**  $x \neq 2$  (3 pts) all or nothing

14.  $f^{-1}(2) = -3$  (3 pts) all or nothing
15. (c)  $(f^{-1})(x) = \sqrt[3]{x-2}$ . (3 pts) all or nothing
16.  $(g \circ f)(0) = 0$ . (3 pts) all or nothing
17. (a)  $\log_4 \frac{3x-1}{x+1} = 6$ . (3 pts) all or nothing
18.  $y = 21$  (3 pts) all or nothing
19.  $c_3 = -22$  (3 pts) all or nothing
20. 9.3 years *Unit need not be present* (3 pts) all or nothing
21. (c)  $5^{3x} = 3$ . (3 pts) all or nothing
22.  $\frac{A}{x} + \frac{B}{x+1} + \frac{C}{(x+1)^2}$  (4 pts) all or nothing
23.  $x = -8, y = -13$  (4 pts) 2 pts for each correct variable
24. 15 (4 pts) all or nothing
25. (b)  $\frac{2}{x+4} - 5 \geq 0$  (3 pts) all or nothing



26. (3 pts) all or nothing
27. (b)  $(-\infty, 2] \cup (6, \infty)$ , (c)  $(-\infty, 2]$  or  $(6, \infty)$  (2 pts) all or nothing
28. (a)  $(3x-1)(x+2) > 0$ . (4 pts) all or nothing
29.  $(f+g)(1) = 3$  (4 pts) all or nothing
- 30(a).  $(1, \infty)$  (2 pts) all or nothing  
*Answer may be written in any form*
- 30(b).  $(2, 0)$  (2 pts) all or nothing  
*Answer must be written as an ordered pair*

31.  $S = -4843$

(7 pts) For correct answer with supporting work.

(0 pts) For correct answer with NO supporting work

**If the answer is NOT correct:**

(4 pts) For calculating  $n$  correctly:  $n = 58$

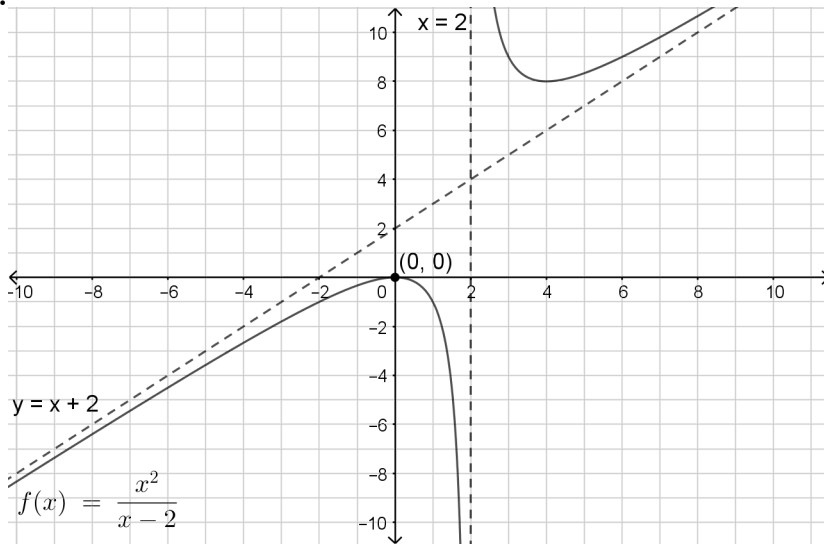
**OR**

(3 pts) For using formula to find the sum correctly.

Award these points if  $n$  is incorrect, but correctly used to find the sum:

$$S = \frac{n}{2}(a_1 + a_n) \quad a_1 = 2, a_n = -169$$

32.



(9 pts) If the graph is sketched perfectly

**If the graph is NOT sketched correctly:**

(3 pts) For all of the following:

- Graph is sketched over the entirety of the domain
- Correct number of vertical asymptotes are present on the graph
- Correct type of non-vertical asymptote is present on the graph
- Graph clearly demonstrates knowledge of asymptotic behavior

**THEN**

(2 pts) For all of the following:

- Correct  $x$  and  $y$  intercepts are present on the graph
- No extraneous intercepts are present on the graph

**33.**  $(-3, 2, 1)$  **OR**  $x = -3, y = 2, z = 1$

**(7 pts)** For correct answer with supporting work.

Either form of the answer is acceptable

**If the answer is NOT correct:**

**(4 pts)** For having reduced row echelon form or row echelon form on the left side of the matrix

for example: 
$$\left[ \begin{array}{ccc|c} 1 & 0 & 0 & - \\ 0 & 1 & 0 & - \\ 0 & 0 & 1 & - \end{array} \right]$$

**OR**

for example: 
$$\left[ \begin{array}{ccc|c} 1 & - & - & - \\ 0 & 1 & - & - \\ 0 & 0 & 1 & - \end{array} \right]$$

specifically, the right side of the matrix is in a correct form

**and** there is reasonable work shown to justify the final (incorrect) answer

**34.**  $x = 5$

**(7 pts)** For correct answer with supporting work.

**If the answer is NOT correct:**

**(4 pts)** For getting to the correct quadratic equation using valid logarithmic properties

35.

(7 pts) For correct answer with supporting work.

Here are the answers for various roundings of  $k$ :

if  $k = \frac{\ln 2}{6}$  then  $N(t) = 20,318$

if  $k = 0.11552$  then  $N(t) = 20,315$

if  $k = 0.1155$  then  $N(t) = 20,298$

if  $k = 0.116$  then  $N(t) = 19,896$

if  $k = 0.12$  then  $N(t) = 24,302$

If the answer is NOT correct:

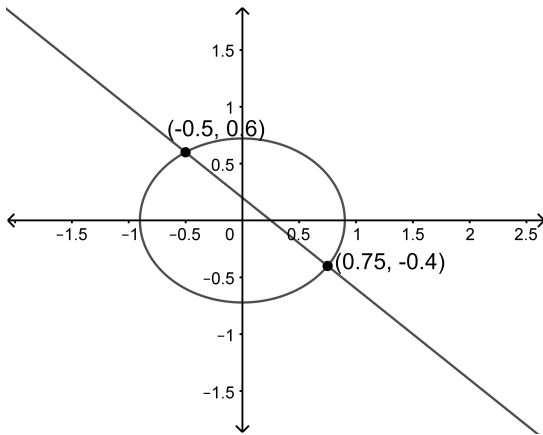
(4 pts) for correct value of  $k$ .

36(a)

far left point  $(-1 < x - \text{value} < 0, 0.5 < y - \text{value} < 1)$

far right point  $(0.5 < x - \text{value} < 1, -0.5 < y - \text{value} < 0)$

(1 pt) for each reasonable estimate for the ordered pairs, up to 2 pts



(b)  $(-\frac{1}{2}, \frac{3}{5})$  and  $(\frac{3}{4}, -\frac{2}{5})$

(5 pts) For correct answer with supporting work.

**If the answer is NOT correct:**

(2 pts) For valid algebraic substitution as first step.

**THEN**

(2 pts) For correct numeric answer for one variable

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

(5 pts) For correct answer with supporting work.

**If the answer is NOT correct:**

(2 pts) If student cleared the denominator in preparation to solve for appropriate variable.

38.  $(-\infty, -6] \cup (1, \infty)$

(8 pts) For correct answer with supporting work.

**If the answer is NOT correct:**

(3 pts) for choosing correct denominator to simplify equation

(2 pts) for finding the correct expression compared to zero

**OR**

(3 pts) for indicating the correct restriction(s) on the domain

(2 pts) for finding the correct expression compared to zero