

DO NOT TURN THIS PAGE UNTIL YOU ARE INSTRUCTED TO DO SO

- ❖ Write your name below on the space provided.
- ❖ This test has a total of 5 pages.
- ❖ Work the problem in the space provided. If you need more space, write on the back of the test.
- ❖ To insure maximum credit, show your work. In general, full credit will not be given for unsupported answers.
- ❖ Look only at your test. Don't give me the impression that you are cheating.
- ❖ Be sure to write neatly. If I cannot read what was written, do not expect the problem to be graded.
- ❖ If you finish early, go over the test again.

Good luck!

Number	Maximum	Score
1	8	
2	6	
3	12	
4	6	
5	20	
6	6	
7	3	
8	24	
9	6	
10	1	
11	2	
12	6	
Total	100	

Name _____

CIRCLE FINAL ANSWERS

1) (4 points each) Find the domain of the following functions

a) $f(x) = \frac{5x+7}{x^2-4}$

b) $g(x) = \sqrt{2x-7}$

2) (3 points each) For the function $f(x) = x^2 + 5x - 3$, find...

a) $f(-1)$

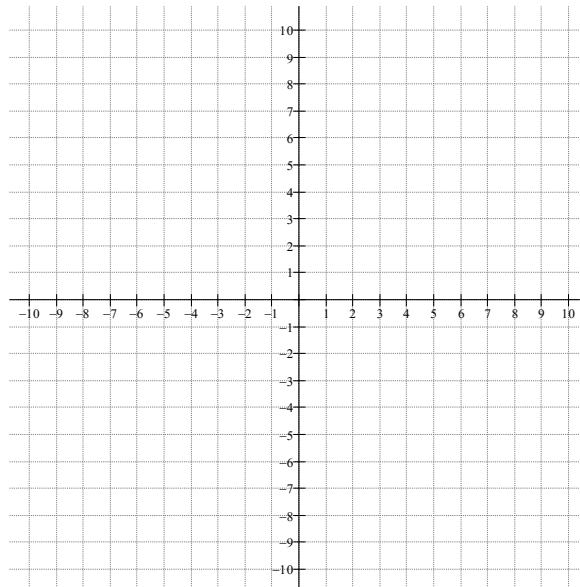
b) $f(x+h)$

3) (4 points each) For the quadratic function $f(x) = x^2 - 2x - 8$, find...

a) The vertex:

b) The intercepts (label answers):

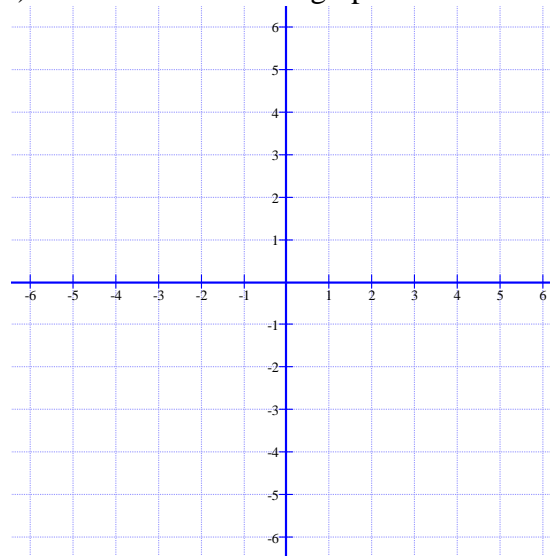
c) Sketch the graph using the above:



4) (3 points each) For the function $f(x) = -2(x+1)^2 + 4 \dots$

a) Explain, in order, the steps needed to sketch the graph:

b) Sketch and label the graph:



5) (4 points each) For the function $f(x) = \frac{2x+2}{x^2-1}$, find...

a) The domain:

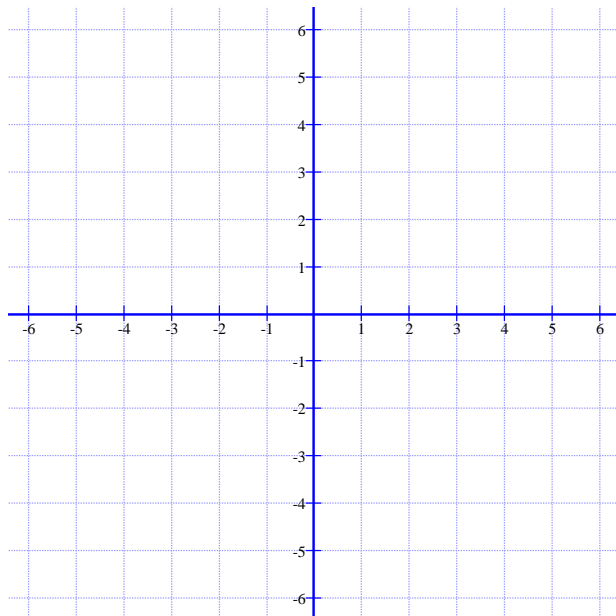
b) The intercepts (if any):

c) Any vertical asymptotes and holes:

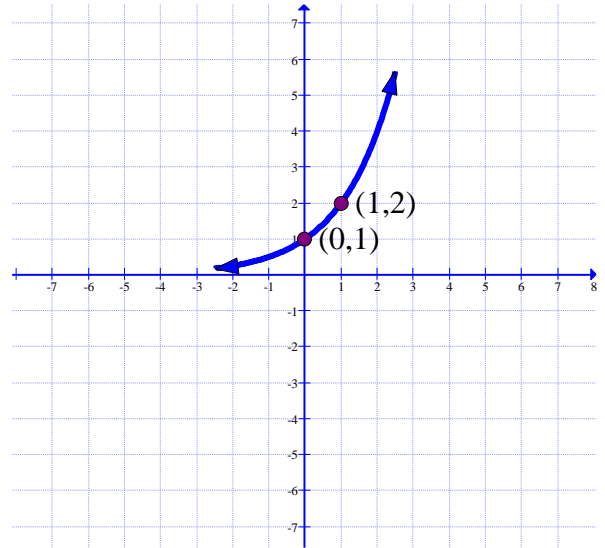
d) Any horizontal or oblique asymptotes:

e) Sketch a graph using the above information.

HINT: Consider transformations based on the simplified version of the function!



- 6) (6 points) Given the graph of $y = 2^x$ to the right, write the steps necessary to sketch the graph of $f(x) = 2^{x-3} - 4$ using transformations and then sketch the graph of the function. Be sure to label the transformed points and asymptote:



- 7) (3 points) Write the expression as one logarithm: $5\log x + 9\log y - \frac{1}{3}\log z$

- 8) (6 points each) Solve for the variable. Be sure to find the exact value.

a) $2^{2x-1} = 16^{x+4}$

b) $10e^{4x+1} = 13$

c) $\log_2(x+1) - \log_2(x+2) = \log_2 8$

d) $\ln(3x+4) + 3 = 12$

9) The video “My Cat Powers Up His Attacks” started to go viral last year. At 8 am, when the video was posted, there were 300 views. At noon, there 12,000 views. Assume that the number of views is growing exponential and use the formula $P(t) = P_0 e^{kt}$ where P is the number of views and t is the number of hours past 8 am.

a) (6 points) Determine the exact value for the growth rate k .

b) Extra Credit (2 points): Determine the exact time in hour:minute:second format when there was 60,000 views.



10) (1 measly point) Fill in the blank: John Jacob Jingleheimer Schmidt, a foreign exchange student from Norway, is in your math class. (Yes, in the future, you’ll be teaching math—kudos: me.) He asks one day for you to pronounce $\log_4 12$ for him. You reply “Gladly, it’s pronounced _____”

11) (2 points) Short answer: Why are logarithms necessary?

12) (3 points each) Clearly explain how to find the following algebraically:

a) Vertical Asymptotes and Holes:

b) Horizontal and Oblique Asymptotes: