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**MAC 1105 COLLEGE ALGEBRA**

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Submit your answer through the Canvas link before July 12, 2020 midnight.

No late submission will be accepted. Submission by email is not accepted.

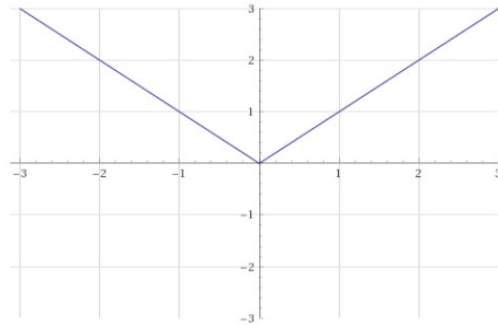
!!!! For full credit, you have to show all your work (steps) clearly. !!!!

!!!! You don't need to print this test. You can write your answers on a separate sheet(s).

You are also allowed to use the textbook, lecture notes posted on the web, your own notes, but nothing else.

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1. (8 points) The graph of  $y = |x|$  is given

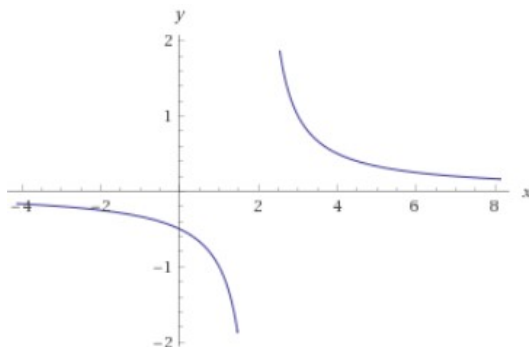


- a) Graph  $y = |x - 2| - 1$  using the parent function  $y = |x|$  and explain the transformations
- b) Graph  $y = 2|x| - 3$  using the parent function  $y = |x|$  and explain the transformations
2. (9 points) The function  $f(x) = \sqrt{x+1} + 2$  is given.
- a) What is the base function? Graph the base function.
- b) Write the transformations in order
- c) Graph the function  $f(x)$
3. (9 points) Determine whether the graph of the equation given below is symmetric with respect to x-axis, y-axis, origin, or none of these
- a)  $x^2 = y^2 + 2$
- b)  $x^2 = y + 2$
- c)  $x = y^2 + 2$
4. (9 points) Determine if the function is odd, even, or neither
- a)  $f(x) = x^3 + x$
- b)  $g(x) = (x^3 + x)^2$
- c)  $h(x) = \sqrt{x^3 + x}$
5. (9 points) A mechanics calculates the fee based on the length of the repair time. Up to 30 minutes, it costs \$35. Over 30 and up to 120 minutes, it costs \$35 plus \$1 per minute above 30 minutes. Over 120 minutes, it costs \$150.
- a) Write a piecewise function  $P(t)$  which represents the fee you need to pay.
- b) How much do you need to pay if the repair time is 85 minutes?
- c) Graph the piecewise function  $P(t)$
6. (12 points) Let  $f(x) = (x^2 - 1)^2$
- a) Identify the end behavior
- b) Find zeros and multiplicities
- c) Find y-intercept
- d) Graph the function  $f(x)$

7. (8 points) Divide  $(-5x^4 + 4x^2 - 11x + 10) \div (x + 4)$

- a) Using long division
- b) Using synthetic division

8. (20 points) The graph of  $f(x) = \frac{1}{x-2}$  is given below



- a) As  $x \rightarrow -\infty$ ,  $f(x) \rightarrow$  \_\_\_\_\_
- b) As  $x \rightarrow 2^-$ ,  $f(x) \rightarrow$  \_\_\_\_\_
- c) As  $x \rightarrow 2^+$ ,  $f(x) \rightarrow$  \_\_\_\_\_
- d) The vertical asymptote is the line \_\_\_\_\_
- e) The horizontal asymptote is the line \_\_\_\_\_

9. (16 points) Let  $f(x) = \frac{4x}{x^2-9}$ .

- a) Identify the  $x$ -intercept(s)
- b) Identify  $y$ -intercept
- c) Identify any vertical asymptotes
- d) Identify the horizontal asymptote or slant asymptote if applicable