

Practice Exam I

Math 1050 001 Summer 2013
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Jul 11th 2013

Name and Unid:

by writing my name I swear by the honor code

Read all of the following information before starting the exam:

- Show all work, clearly and in order, if you want to get full credit. I reserve the right to take off points if I cannot see how you arrived at your answer (even if your final answer is correct).
- Justify your answers algebraically whenever possible to ensure full credit. Sketch all relevant graphs and explain all relevant mathematics.
- Circle or otherwise indicate your final answers.
- You MAY NOT use a calculator or notes. You may use the formulas provided.
- This test has 11 problems and one bonus problem and is worth 100 points, plus some extra credit at the end. It is your responsibility to make sure that you have all of the pages!
- Good luck!

Good Luck!

1. (5 points)

a. (3 pts) Is the triangle with vertices $(-1, 3)$, $(3, 5)$ and $(5, 1)$ a right triangle? Justify your answer.

b. (2 pts) What is the mid point between the points $(3, 5)$ and $(5, 1)$?

2. (10 points) Find the equation of the line through the points $(-1, 1)$ and $(1, 7)$ and sketch it.

3. (5 points) Find the equation of the line perpendicular to the line $y = \frac{2}{3}x + 1$ Going through the point $(0, 2)$

4. (10 points) Find the domain of the function $f(x) = \frac{x^2}{\sqrt{x-2}}$

5. (10 points) Classify the following functions as odd, even or neither. Justify your answer

a. (5 pts) $f(x) = x^2 + x^4$

b. (5 pts) $f(x) = x^3 - 1$

6. (5 points) Let $f(x) = x^2 + x + 1$ and $g(x) = x + 3$ find $f(g(x))$.

7. (15 points)

a. (5 pts) For the parent function $f(x) = |x|$ find the equation that results from a reflection over the x-axis a shift to the right 3 and shift down 2.

b. (10 pts) Sketch the graph of $f(x) = -2(x - 2)^2 + 8$ Include the x and y intercepts as points on your graph. Label the vertex. What is the maximum value of $f(x)$

8. (10 points) Write the quadratic equation $f(x) = x^2 - 6x + 8$ in standard form.

- 9.** (*20 points*) For the polynomial $f(x) = 2x^4 + 5x^3 - 5x^2 - 5x + 3$
- a.** (*5 pts*) List all of the possible rational zeros of $f(x)$

b. (*5 pts*) How many possible numbers of positive roots are there?

c. (*5 pts*) How many possible numbers negative roots are there?

d. (*5 pts*) Find the zeros of $f(x)$ and write it as a product of its linear factors.

- 10.** (15 points) For the function $f(x) = \frac{2x^2+6x+4}{x^2+x-6}$
- a.** (5 pts) Find all of the vertical and horizontal asymptotes

b. (5 pts) Find the x and y intercepts

c. (5 pts) Sketch the graph of $f(x)$

11. (10 points)

a. (5 pts) Given $f(x) = \sqrt{x+2} - 1$ find $f^{-1}(x)$

b. (5 pts) If $f(x) = 3x + 1$ and $f^{-1}(x) = \frac{x-1}{3}$ verify that that $f(f^{-1}(x)) = x$ and $f^{-1}(f(x)) = x$

12. (5 points) (Bonus all or nothing) The equation for the height of a falling object is given by $h(t) = \frac{-1}{2}gt^2 + v_0t + h_0$ where t is the time in seconds v_0 is the initial velocity of the object and h_0 the initial height. Suppose you drop your math book off of the library which has a height of 50m how long before it hits the ground? Take the acceleration of gravity $g = 10m/s^2$.

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