University of Lethbridge
Department of Mathematics and Computer Science
19th October, 2015, 4:00 - 4:50 pm
MATH 1010A - Test #1

Last Name:_____

First Name:_____

Student Number:_____

Tutorial Section: _____

Record your answers below each question in the space provided. Left-hand pages may be used as scrap paper for rough work. If you want any work on the left-hand pages to be graded, please indicate so on the right-hand page.

Partial credit will be awarded for partially correct work, so be sure to show your work, and include all necessary justifications needed to support your arguments.

No external aids are allowed, with the exception of a 5-function calculator.

For grader's use only:

Page	Grade
2	/10
3	/10
4	/10
5	/10
Total	/40

B

1. Simplify the following expressions. Your final answer should be in the form $\frac{A}{B}$, where A and B are integers.

[3] (a) $\dfrac{1-\left(\frac{3}{5}\right)\left(\frac{5}{9}\right)}{1+\left(\frac{3}{5}\right)\left(\frac{5}{9}\right)}$.

[3] (b) $\left(\dfrac{64}{125}\right)^{-2/3}$.

2. Simplify the following expression. Your final answer should be in the form $\frac{A}{B}$, where A and B are polynomials.

[4]

$$\frac{x+1}{2+x}+\frac{2x}{2-x}-\frac{5x+6}{4-x^2}$$

3. Solve the following inequalities:

[3] (a) $\frac{3}{4} - x \leq \frac{6x-2}{3}$.

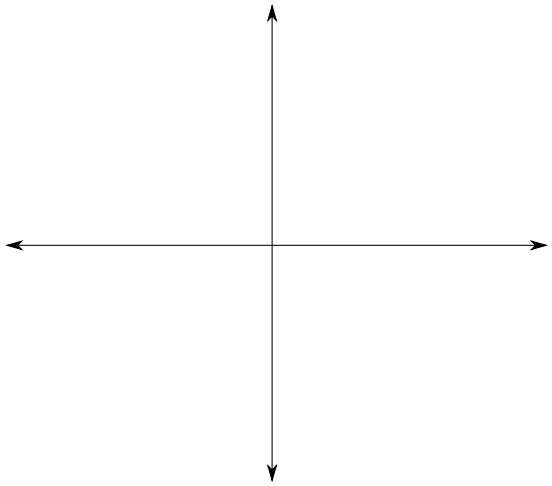
[4] (b) $5x \geq 2 - x \geq 0$

[3] (c) $|2x + 1| < 5$

4. Consider the function $f(x) = -x|x|$.

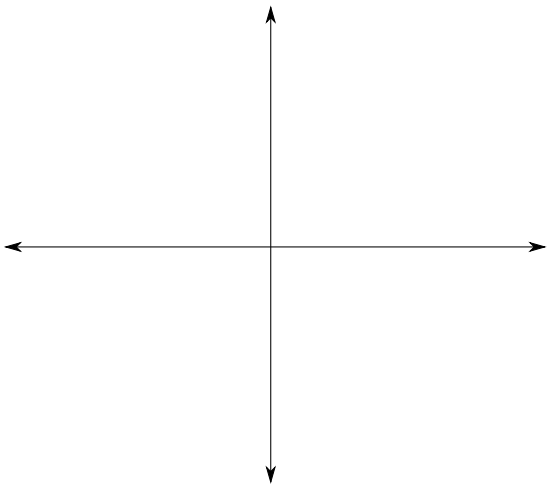
[3] (a) Evaluate the following: $f(2), f(2) + f(-1), f(-2) \cdot f(3)$.

[3] (b) Sketch the graph of f. (Hint: consider the cases $x \geq 0$ and $x < 0$.)

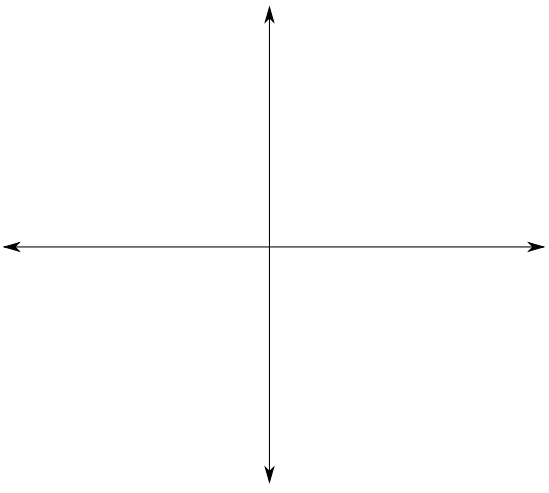


[4] (c) Sketch the graphs $y = f(x-3)$ and $y = -\frac{1}{3}f(x) + 1$.

Note: if your graph in part (b) is incorrect, credit will be awarded for correct transformations of an incorrect graph.



$y = f(x-3)$



$y = -\frac{1}{3}f(x) + 1$

5. Consider the function $f(x) = x^2 + 4x - 12$.

[4] (a) Determine the sign diagram for f.

(b) Using your answer from part (a), solve the following:

[1] i. $f(x) = 0$.

[1] ii. $f(x) \geq 0$.

(c) Since f is a quadratic function, its graph is a parabola. Determine the location of the vertex of the parabola, as well as any x or y-intercepts. (You do not have to sketch
[3] the graph.)

[1] (d) What is the domain of the function $g(x) = \dfrac{1}{\sqrt{12 - 4x - x^2}}$?